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THE CASE FOR EXAMINATIONS

*AN ACCOUNT OF THEIR PLACE IN EDUCATION
WITH SOME PROPOSALS FOR THEIR REFORM*

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PREFACE

THE PURPOSE of this book is to show that examinations are an essential part of the machinery of education; that is, the machinery for training children and adults to use their minds and bodies in new ways. It is advisable to state this at the outset, because many people now regard them merely as a necessary evil.

The most individual systems of education lay upon the teacher the obligation to *stimulate* and *direct* the interest of his pupils, so that they apply themselves to their work in the knowledge that it will bear fruit later. Unless modern mass education includes a means of stimulating teachers and students to effort, and of directing and co-ordinating that effort to suit the needs of a rapidly changing and developing society, the money spent on schools, textbooks, and salaries will be wasted. The 'joint examinations' which I see arising out of the old 'external examinations' have a vital part to play in solving these problems, for they can achieve the desired ends and yet allow scope for individual freedom and initiative.

The examinations with which we are concerned in this book are, by their very nature, linked with the course of study leading up to them and with the subsequent activity available to the successful student. They differ in this respect from intelligence and aptitude tests like those now being used for army recruits. These are intended to provide a means of classifying people according to their abilities in certain directions. They often open doors to further activity, but they have no concern with a previous course of preparation, and, in fact, presuppose that there has been no such course.

I do not wish to assert that examinations are the only means of stimulating and guiding the interests of boys and girls within a complex educational system. But no competent observer will deny that examinations are now woven into the fabric of English education and play an intimate part in holding it together. Part I of this book will describe how this has come

about, and help to explain why our present examinations are warping as well as strengthening the fabric.

Changes in the organisation and control of school examinations are overdue, and, when made, will exercise a profound influence on the whole of education. Part II will describe the alterations which appear to the author to be indicated as a result of the analysis in Part I.¹

The book omits much of the technique and theory of examinations. Such subjects as the validity of tests, the standardisation of marks, the fallibility of examiners, the setting and moderating of question papers, etc., are barely touched upon; not because they are unimportant, but because they have been dealt with by other writers. As war conditions leave the day-to-day administrator little time for writing, I have concentrated on those aspects of the subject that seem to me to have been neglected, or to be of particular importance at the present time. Instead of attempting a direct answer to some of the many critics of our present examinations, I have tried to indicate a broader view of the whole subject in the light of which some of these criticisms may need to be reassessed.

The book is written from the point of view of one who has been concerned for sixteen years with the examinations of a single University Examining Body, and mainly with the science side of that work.

My examples are naturally drawn from the examinations about which I know most, but I think the principles deduced will be found to be general. Had I been concerned with London University, I might have had more to say about London Intermediate and less about the Cambridge Scholarship Examinations, but I think the conclusions would have been the same.

Since the book was started in September, 1942, many moves have been made in the direction of the reforms advocated, and I hope that by the time it is published a start will have been

¹ The Norwood Committee's *Report on Curriculum and Examinations* was published when this book was practically finished. I have devoted an additional chapter to it.

A striking feature about learning to ride a bicycle is that, while a certain amount of instruction may be helpful, success is almost entirely the result of practice. You can read books on bicycling, receive advice from your friends, or watch other beginners learning to ride, but nothing can take the place of getting on, and falling off, a bicycle. We learn to do things by doing them. The eyes, brain, and muscles acquire new habits by continued practice. The same principle underlies learning to play the piano, to do mathematics, to master a foreign language, to understand chemical equations, or to write and speak effectively. In fact, in every branch of education, practice makes perfect. But regular practice requires concentration, determination, and effort. This effort is only forthcoming when the student is convinced that the benefits to be obtained will be worth the effort expended. The benefits of being able to ride a bicycle are obvious and easily realisable. For this reason, most children and many adults have been able to master this quite difficult accomplishment without any special inducements.

We are apt to take for granted some of the most striking successes of education. It is a remarkable fact that nearly the whole population learns to read with so little fuss, and in spite of much comparatively unskilled teaching. And this does not apply only to the young. In Russia, large numbers of old people have learnt to read during the last ten or fifteen years. It seems that, given reasonable assistance in the form of reading-books and teachers, and plenty of reading matter which they want to be able to understand, children learn to read almost as easily as to walk. But it must not be thought that these new skills are acquired without considerable perseverance and effort.

The two points I wish to emphasise are, first, that learning is mainly a matter of practice requiring continued effort, and, secondly, that this effort is forthcoming when the benefits accrue continuously and progressively as greater proficiency is reached. The more directly and immediately you benefit from increased proficiency in the subject you are studying, the more

your interest is kept up, and the more easily your will power summons the effort required. This condition for easily sustained effort depends as much on circumstances as on the subject. Suppose I wish, for some reason, to learn to write with my left hand. Normally, this is such a tedious proceeding that I am unlikely to keep it up with sufficient regularity to succeed. But, let my right hand become temporarily or permanently incapacitated and the whole situation is altered. It becomes a matter of urgency to develop at least a little skill, and each step of progress is amply rewarded. Many similar examples could be mentioned of the way in which a change of circumstances may enable people to learn with comparative ease what they previously considered to be difficult tasks. A blind man learns to read braille much more readily than a man with normal sight; a boy has less difficulty in picking up a knowledge of book-keeping in his spare time if he is employed in an accountant's office than he would have if his employment had nothing to do with accounts. Another example is learning a modern language. It is obviously easier to learn a foreign language in the country where it is spoken than in one's own country. The difficulties of learning French in England are well known to secondary school boys and girls, few of whom would attempt to tackle it by themselves; but let them be transported into French families in France for a few months, and they would soon learn to speak and even to write the language fairly correctly. Unfortunately, in present-day England, circumstances do not always come to the student's aid. More often, boys and girls have to learn in the face of unnecessary difficulties which make the benefits to be obtained seem slight or even purely hypothetical in relation to the effort required for continuous study or practice. This applies especially to children from poor, overcrowded homes.

Though learning and true education are achieved by continuous processes of activity directed towards a future goal, these processes divide themselves into stages. The child learning to ride a bicycle comes to a point where he may be discouraged. He has to pass from the stage of being assisted by someone else

to the stage of entrusting himself to his own skill. Then perhaps a wise parent will help with the offer, 'I'll give you sixpence if you can ride as far as that lamp-post to-night without my help'. Although the parent may not realise it, this constitutes an examination. The child concentrates his attention on getting to the lamp-post, not for the moment because he wants to be able to ride a bicycle, but because he wants sixpence.

The success of an examination as a stimulus to effort depends on four factors: (1) a suitable reward for success; (2) a limited time; that is to say, the examination cannot be postponed indefinitely; (3) knowledge that the examination will be conducted fairly and honestly; (4) knowledge that it will be neither too hard nor too easy for the students who are to take it.

In our simple example of the bicycle, the reward is there; for the child knows from experience what importance he can attach to his father's promise of sixpence. The time element is present; for the task has to be performed 'to-night'. The standard is suitable; for if the test is too easy, the father will have given sixpence without any resulting benefit; and, if it is too hard, the child will consider the offer merely a joke. The examination is fair; for the father is present to see that there is no cheating, and there need be no argument as to whether the lamp-post has been reached or not.¹ Let us turn now to a rather more complicated example of the use of an examination as a stimulus to the individual student, by considering an examination in English for a foreign student learning the language in England.

We will take for this example a member of one of the allied armies stationed in England who is unable to attend school or

¹ We shall see later that an examination in the complete sense in which the word is used in this book should possess a further characteristic. It should be the gateway to further activity. If the father posed the question, 'I will let you come out for a bicycle ride with me at the week-end if you can ride to the gate, turn round, and come back to me without falling off', success in the examination would lead the child on to the new stage of 'going out for a ride'. The test is also partial because it is taken by only a single candidate; this leads to an arbitrary fixing of the standard by the parent.

English classes, and who undertakes to learn English with grammar and phrase books and by trying continually to make himself understood in conversation. He soon achieves a certain degree of proficiency, enough to enable him to get along in everyday life without serious inconvenience to himself. For two reasons many foreigners never pass beyond this stage in learning English, although they may live permanently in England. First, the steps required to gain further proficiency involve serious study of the kind normally associated with academic education. Thus, the student must now give up more time to learning grammar; he must take steps to discover whether he is talking 'good English'; he must learn to write, as well as to speak and understand the spoken word, and this involves learning to spell. He must also study something of the literature and customs of the country if he is to take his place as a reasonably normal member of society. Secondly, the direct stimulus to effort becomes fainter at this stage. Although further steps towards proficiency bring with them the reward of a more complete intercourse with English people and perhaps possibilities of promotion or employment after the war, nevertheless the prospect of these benefits may be too remote.

Modern education employs many devices to help boys and girls through stages in which their wish to succeed is overlaid by discouragement at lack of success. Well-organised schools, highly trained and skilled teachers, scientifically graded syllabuses are examples of such devices. Although most of these aids are denied to the solitary student, a suitable public examination may be a great help to him. We will take as an example the examination for the Certificate of Proficiency in English conducted by the University of Cambridge. Papers are set in (1) translation from foreign languages into English; (2) translation from English into these languages; (3) English literature, customs, methods of government, etc.; and there is an oral examination in the spoken language. Any student can take this examination on payment of a comparatively small fee, and, if he is successful in passing, he will receive a 'Certificate of Proficiency'. In order to get a clear understanding of the

part which such an examination plays in helping a foreign student to learn English, let us apply to it the four criteria of success already mentioned in connection with learning to ride a bicycle.

First, the reward for success must be sufficient. In this case the visible reward is a certificate, the real value of which depends upon its acceptance by potential employers, or institutions for further education, as evidence that the student has pursued successfully a serious course of study; that he has, in fact, become proficient by practice in doing certain things. Anyone offering employment to a foreigner who holds this certificate can be satisfied that he has written correct English, spoken with a reasonable accent, etc. A university accepting such a student knows that there is a good prospect that he will be able to profit from a course of further study. An examination is both the culminating point of a period of prolonged effort and a goal which presents itself to the student as the gateway to a promised land. A certificate is thus not so much a reward in itself as a link bringing into concrete relationship with the student the reward provided by future employment or educational possibilities; it is something worth possessing as a token of benefits to follow. There are, of course, many subsidiary reasons why children and their parents value examination certificates. Prestige and pride undoubtedly play a part, but are easily traceable to the real reputation of the certificate, which depends, in the long run, on the experience of those possessing it—on their success in obtaining with its aid the kind of work or further education that they seek.

This power of an examination to link one phase of a student's activity with a subsequent phase is important from the educational point of view. True learning results from activity which is directed towards a future aim as well as to an immediate purpose. This continuity of education is often obscured because we possess so few facilities for organised adult education. Training and education cannot be separated from life. Adults are doing things every day which form and modify their mental habits, and no sharp distinction can be drawn between

this process and education. Similarly, the child's schooling is also his life.

The continuity of experience, whether professedly educational or not, is discussed by Dewey in *Democracy and Education*,¹ especially in Chapter VIII, 'Aims in Education'. Like many of Dewey's writings, this chapter is diffuse, and it is difficult to convey his sense by a single quotation. The following passage expresses enough for our purpose:

The aim must always represent a freeing of activities. The term *end in view* is suggestive, for it puts before the mind the termination or conclusion of some process. The only way in which we can define an activity is by putting before ourselves the objects in which it terminates—as one's aim in shooting is the target. But we must remember that the *object* is only a mark or sign by which the mind specifies the *activity* one desires to carry out. Strictly speaking, not the target but *hitting* the target is the end in view; one *takes* aim by means of the target, but also by the sight on the gun. The different objects which are thought of are means of *directing* the activity. Thus one aims at, say, a rabbit; what he wants is to shoot straight: a certain kind of activity. Or, if it is the rabbit he wants, it is not rabbit apart from his activity, but as a factor in activity; he wants to eat the rabbit, or to show it as evidence of his marksmanship—he wants to do something with it. The doing with the thing, not the thing in isolation, is his end. The object is but a phase of the active end—continuing the activity successfully. This is what is meant by the phrase, used above, 'freeing activity' [at p. 123].

The claim that examinations have a vital part to play in education is based on the assumption that success in the examination is not viewed or sought after as an end in itself. Hence the importance of regarding examinations as a link between two phases of activity, *not merely as the end of one phase*.

Most examinations provide various grades of success. The old Local Examinations of Oxford and Cambridge issued certificates in three classes of honours, as well as ordinary pass certificates. University Honours Lists are usually divided into three classes. In the individual subjects of many examinations

¹ John Dewey, *Democracy and Education*, The Macmillan Company, New York, 1930.

'distinction' or 'special mention' is awarded to the student gaining high marks. These are all devices for increasing the reward for the better students, while, at the same time, giving an opportunity to the ordinary plodder to gain the certificate. The differentiation of certificates in this way ensures that the same examination provides a stimulus for a wide range of students. There has been criticism from time to time of the excessive competition thus created in some examinations. As a result of the Consultative Committee's 1911 *Report*, Honours and Distinctions were partially abolished in many public examinations, and ten years later completely abolished, but it is interesting to note that similar differentiation of certificates has since been reintroduced into the School Certificate Examination (see p. 108), and that Sir Michael Sadler has called attention to the beneficial results which followed the division of the Honours List at Oxford into two classes.¹

Secondly, the time at which an examination is to be taken must be fixed in relation to the student's course of preparation for it, and many practical considerations are involved. Some examinations take place once a year and may be taken by the same student as many times as he wishes. Others, such as the University Honours Finals at Oxford and Cambridge, can be taken once only; while other examinations, of which the London External Intermediate is an example, may be taken in portions on succeeding occasions. In the School Certificate Examination all subjects must be taken at one and the same time, and the candidate taking the examination on a second occasion is not allowed to count passes in subjects taken previously. Further,

¹ 'At Oxford, Cyril Jackson, Dean of Christchurch, John Eveleigh, Provost of Oriel, and John Parsons, Master of Balliol, were chiefly instrumental in passing in 1800 the new Examination Statute, which, in the words of the Oxford University Commission of 1850, "first raised the studies of the University from their abject state". By this Statute which made use of the principle of competition, the Honour List was divided into two classes in which the names were arranged in order of *mérit*.' Sir Michael Sadler, *Essays on Examinations*, International Institute Examinations Enquiry, Macmillan, 1936, p. 60.

the dates of such examinations as the Tripos at Cambridge, and the School and Higher School Certificate Examinations, are fixed by the termination of the university or school year, whereas no similar restriction limits the dates of such examinations as London Matriculation.

We are concerned here with only one aspect of this question, namely, its influence on the work of the students. A student works best if he knows that the date of his examination is unalterable, but some flexibility is desirable to cover the case of the student who may be compelled to alter his plans by forces outside his control. We find the most rigid system at the resident universities, where the student has three years to devote exclusively to study, and where the authorities are concerned to encourage him to make the most of this vital period. On the other hand, the London Matriculation Examination, whose reputation is no doubt due largely to the lack of flexibility in its actual requirements, was designed to meet the needs of many students who had to study in their spare time. We find, therefore, that this examination is held three times a year, and that the unsuccessful student is allowed to try again if he fails.¹ In fact, if we may liken an examination to a carrot dangled in front of a donkey's nose, the extremely varied regulations governing different examinations can be viewed as the manipulation of the carrot. The regulations ought to be sufficiently reasonable to avoid discouraging the candidate, but sufficiently stringent to stimulate the work out of which his learning and education arise. The Certificate of Proficiency in English is held on dates suited to the students taking it, and the regulations allow sufficient flexibility to encourage those working under peculiarly difficult conditions.

Thirdly, the examination must be fair. It is clear that a student will work confidently for an examination if he is satisfied that he will be judged by entirely impartial examiners,

¹ It is an interesting point that the added difficulties of these students since the war have been recognised by allowing a candidate who passes in four of the five subjects to take the fifth one alone on a subsequent occasion.

who will pass him if he is worthy to pass, and fail him if he is weak. One factor that makes for such confidence is the use throughout of examination numbers instead of names. Another, is the readiness of the examining body to verify any results which may be in doubt, and to admit errors if they are brought to light. But there are also a number of less obvious factors contributing to the fairness of an examination, which are dependent upon the technical skill and experience of those responsible for it. One such factor is the need to maintain the same pass standard from year to year. Students will not work confidently for an examination unless they know that the examiners will not suddenly and arbitrarily 'make it more difficult to pass this year than last year'. This constitutes one of the main technical problems of those in control of examinations and will be discussed in some detail in the next chapter. Another technical problem affecting the fairness of examinations, namely, the standardisation of the examiners themselves, can be illustrated by means of an example from the Proficiency in English Examination.

In this examination each student's spoken English is tested, probably by a single examiner who, by talking to him, forms an impression of his conversational ability, and classifies it as 'very good', 'good', 'pass', 'fail', or assigns marks which indicate these standards. But, by reason of the number of students to be examined, it is not always possible for the same examiner to converse with all the candidates. The work is therefore shared between two or three examiners, each responsible for a certain number of students. Apart from any question of favouritism, there is a danger that any two examiners will have different ideas of what constitutes a 'good command of spoken English'. One examiner may have been dealing with a number of candidates with an exceptionally good English accent and knowledge of the language, and may have, in consequence, a 'high standard'. Another may have been examining a number of weak students and may be so pleased when a bright one comes along that he overmarks the latter in contrast to the others. If we regard each examiner as

a kind of thermometer for measuring proficiency, it is obviously essential that these thermometers shall all agree in their verdicts. Many devices are now used for training and testing examiners to ensure that they all adopt the same standard. For example, gramophone recordings of the conversations of several typical students with an examiner can be made. The examiners assemble, listen to the recordings and write down independently their assessments of each student's proficiency. The markings are then compared for each student, and an agreed mark for each is arrived at. In this way, each examiner is enabled to carry in his mind standards with which to compare a candidate's performance.

The above is but one example of an exceedingly complicated technical problem of examination administration. A whole book has been devoted to the subject by the International Institute Examinations Enquiry.¹ We have indicated some of the problems that face those in control of examinations, and have shown that the fairness of an examination depends upon more than the good faith of the public body administering it. True fairness cannot be achieved without a highly qualified and experienced administrative staff, aided by trained, disciplined, and experienced examiners.

Fourthly, the examination must be of a suitable standard. There is a good deal of confusion, even among those who have most to do with examinations, as to what is meant by the standard of difficulty of an examination. Two kinds of standard have to be distinguished—the standard of difficulty of the tests, and the standard of marks required to pass.

A simple example will make the difference clear. A dozen English-speaking students are taking a paper of translation from English into French. If this group of students is chosen at random, it will include a few with little knowledge of English,

¹ *The Marks of Examiners*, Being a Comparison of Marks allotted to Examination Scripts by Independent Examiners and Boards of Examiners, together with a Section on a Viva Voce Examination, by Sir Philip Hartog, K.B.E., C.I.E. and E. C. Rhodes, D.Sc., Macmillan, 1936.

a few with a good knowledge, and some with a knowledge intermediate between these extremes. We will consider two separate tests given to the same candidates. In the first, the passage for translation is an easy one; that is to say, it consists of simple sentences and contains words in common use. In the second, the passage is a difficult one; it includes complicated constructions, unusual words, and difficult ideas. When the students take the easy paper, several of the best may get full marks, being able to make perfect translations into their own language. Even the weakest students get perhaps 20 to 30 marks out of 100, and most of the remainder get marks well over 50. The examiner decides, on the results of this test, that those with 50 and over shall pass, and we will suppose that this amounts to eight of the twelve students. When the students take the more difficult test, the best achieve only 75 to 80 per cent of the marks; most of the students come between 25 and 55 per cent, and the weakest get very few marks at all. As a result of this test, the examiner decides that those with 30 marks and over shall pass; and again eight of the twelve are successful. Since the same students pass and the same students fail (we are assuming that the same four come at the bottom of the list in each case), we can say that the standard of the result is the same in each case; yet both the *standard of difficulty of the tests* and the standard of marks required to pass are different.

Which of these two kinds of standard influences the value of the examination as a 'means of stimulating effort? Experience shows that the standard of the test is all-important. If this is unsuitable, the examination is a failure. A student working for the examination consults past question papers in order to judge what he must be prepared to do in the examination room. If the tests are within his powers, and yet not too easy, he has to concern himself with the pass mark, that is, with his chances of doing the test well enough to pass. If the tests are so easy that they present him with no problem, the examination is a failure however high a mark is required. If the tests are too difficult, the student is out of his depth from the beginning and the

examination has nothing to offer him in the way of assistance; it is again a failure.

The fourth condition for the success of an examination as a stimulus to effort can thus be stated in two parts: (a) the standard of the tests must be high enough to extend the candidates, and yet not so high as to discourage them; (b) given suitable tests, the pass marks must also be such as to extend the candidates without discouraging them.

This statement of the matter reveals one of the difficulties of setting examination papers. Generally speaking, the students taking a school examination range from very good to very bad. How are the tests to be made suitable for those at both ends of the scale? Various devices are used. In the example already cited, the translation paper can be made to include both the easy and the difficult passages. The students are told to translate both, and their marks for the two passages are added together. The weaker candidates devote their energies mainly to the first, and the better candidates to the second. Mathematics papers can be arranged to include some comparatively easy questions and some questions designed mainly for the better candidate. On the other hand, history, literature, and some science questions are often framed in such a manner that each question affords scope for all grades of students; the problem then becomes one of marking the answers so as to give credit for exceptionally good achievement, while, at the same time, allowing the plodder a fair reward for his work. Such examination questions have no intrinsic standard of difficulty; they are suitable for a wide range of students, and their success as tests depends upon the standard of result expected. Further light will be thrown on this problem in the next chapter, when the distribution of marks is discussed.

But the difficulty of an examination question is only one of its characteristics. The nature of the tests habitually set in an examination from year to year influences in a marked degree the attitude of the students to their studies. Let us consider an example which brings out the interconnection between difficulty and other characteristics. In a practical cookery

examination the following test might occur: 'Plan and cook a three-course dinner for two persons, using the ingredients supplied; recipe books and notes not to be used.' Alternatively, the students might be required to cook any one of twenty or thirty specified dishes, using their recipe books. The second test is probably easier than the first, but, quite apart from this, the effects of the two tests on the students preparing for them are widely different. Students preparing for the second test have to practise making the specified dishes; they need not commit to memory details of the recipes; they concentrate their energies on learning to work quickly and methodically, and on achieving a tasty and well-served result. Students preparing for the first test have to practise planning a meal, which involves a knowledge of food values, and of desirable combinations of dishes. They have to practise adjusting their ideas to the materials available, and they have to commit to memory quantities of ingredients. Perhaps they need not know so great a variety of dishes as the students preparing for the second test. The whole course of preparation will thus be quite different in the two cases, and the qualities and capabilities acquired by the students will tend to correspond with the character of the tests in their examinations.

As another example, let us suppose that the examination for the Certificate of Proficiency in English did not include a test of conversation. This would lead the students to concentrate on book or written work to the neglect of the spoken language. It is also easy to see that the kind of literature prescribed for study (prose or poetry; Shakespeare or modern novels) influences the students' attitude to English literature and to the English language.

We can generalise from these examples, and summarise our conclusions as follows: An examination may exert a powerful influence in mobilising the activity of those preparing for it, provided (1) it carries with it a reward for success suited to the students' requirements; (2) its regulations are neither too lenient nor too stringent in relation to the circumstances in which the students are working; (3) it is known to be fairly

conducted; (4) the standard of its tests is seen by the students to be suitably related to their abilities.

This mobilising influence takes the form of inducing the students to carry out the kind of tasks they will be asked to perform in the examination. If the examiners expect them to translate passages of English into French, they will practise translating such passages; to converse in good English, they will practise this art; to describe experiments with lenses and mirrors, they will concentrate on written descriptions of such experiments; to carry out such experiments, they will learn to conduct experiments themselves. In short, the *nature* of their activity prior to the examination is closely related to the nature of the tests. When we remember that a trained and educated man is one whose mental and physical characteristics have been formed as the result of repeated activity directed towards an end, and that the activities of our children determine in large measure what manner of men and women they will be, we appreciate the immense power wielded by those responsible for public examinations.

EXAMINATIONS AND CLASS WORK. It is unusual to find students preparing for examinations as individuals; they generally find their way into classes where teachers will help them. Even the Certificate of Proficiency in English which caters for individual students staying in this country, has led to the formation of classes both here and abroad. It may be said that these classes are held together by the examination. This state of affairs is not exceptional. The Oxford and Cambridge Locals played a similar part in England seventy years ago. These examinations were taken by individuals who were taught in schools. In the same way, the 'advanced courses' in secondary schools grew up after the last war round the newly established Higher School Certificate Examination. Thus we see that one of the powers inherent in examinations is that of consolidating class work. Let us consider an example of this in more detail.

The teaching of First Aid to the Injured is controlled by two Voluntary Associations—the St John Ambulance Association,

and the British Red Cross Society. The syllabus that students are expected to cover is laid down in textbooks published by these Societies, but we shall see that the actual control of what is taught depends quite as much on the examination run by the Societies as on the textbooks. These examinations are particularly interesting for our purpose because they have an origin similar to the forerunners of our present School Certificate Examinations. Both were launched by independent bodies in an era of free competition at the end of the middle third of the last century. The simple nature of the First Aid Course compared with School Certificate Courses makes it easy to distinguish the basic principles underlying the relation of class teaching to examinations and syllabuses.

The First Aid textbook of the St John Ambulance Association informs us that 'certificates of proficiency in First Aid after attendance at lectures and examinations' were first granted in 1877, and since that date 'the Association has issued to successful students in all parts of the world over two million certificates, which are recognised by the Home Office, Board of Trade, Admiralty, War Office, and other Government Departments and Civil Authorities'. This shows that the certificates fulfil the condition that we have already mentioned of leading on to future work. The educational machinery used by the two Societies may be divided into three parts: (1) textbook; (2) lecture classes and courses of practical instruction; (3) examinations and certificates. The relative importance of each part of the machinery can be seen from the following fictitious example.

The Smith family, Mr, Mrs and Miss, decided, after experience of air-raids, that the time had come for them to learn some First Aid. They bought the St John textbook. Mr Smith immediately set to work to study it, and worked well for a time. His wife and daughter, however, decided to join a local class. Mr Smith thought this unnecessary, as 'it was all in the book'. After a few weeks' attendance at the class, mother and daughter had to make up their minds whether they would take the examination at the end of the course. Mrs Smith had the sense

to see that an early decision to take the examination was the best way to make sure of learning the work thoroughly; also, she wished to join a First Aid detachment when she had completed the course. But her daughter was not prepared to devote the time to study which would be necessary to get through the examination. At this point a difference in behaviour began to show itself between mother and daughter. Mrs Smith chose as her partner in the practical classes another woman who was taking the examination, and these two worked hard. Miss Smith also did the practical work, carried out the bandaging, etc., but without sustained interest. As examination time came nearer, Mrs Smith practised assiduously every evening and persuaded her husband to ask her the questions at the end of the textbook. The members of the class taking the examination arranged special revision classes; they got to know one another, and became really interested in the work. Miss Smith had already missed one or two classes, and dropped out altogether before the end of the course. Her father had gradually allowed Mrs Smith to have first claim on the book and his studying petered out.

The value of the examination to Mrs Smith and the other members of the class was twofold. It supplied them with an immediate objective, and it was so designed as to encourage the kinds of activity that would make the students preparing for it into good first-aiders. Although Mrs Smith transferred much of her immediate interest to the examination, her real interest in the work remained the same, namely, the desire to become proficient and to take her part in saving life.

First Aid examinations usually consist of two or three separate parts, namely, a paper of questions to be answered in writing; a *viva voce* examination, and a practical test. Each of these parts has certain merits and certain disadvantages, and each favours certain types of students. The *viva voce* section is able to test theoretical knowledge without penalising those who have had little training in expressing themselves on paper. It has the disadvantage of frightening nervous or inarticulate students who may be unable to tell the examiner what they

know.' A *viva voce* test is also more difficult to mark than a written test. The written examination has the advantage of definiteness over the other two parts. If the questions are well devised, the student knows exactly what he is expected to do, and the examiner can compare at his leisure the answers of the various students to the same question. It suffers from the defect of favouring the students with the best general education irrespective of their knowledge of the subject in hand.

The practical test consists of pieces of First Aid routine which the students have to perform in front of the examiner. Its great merit is that it gives credit to those who can carry out operations rather than to those who can only talk or write about them. As First Aid is essentially a practical subject, the practical test appears to be of particular importance.

What is the effect of the examination on the class? Although they may not fully realise the fact, it brings the students into direct competition with one another and so places them in an order of merit. We will suppose that Mrs Smith is a practical type of woman, and that her fellow-student, Mrs X, is nervous and unpractical, but well-educated in the ordinary sense of the term; while Mrs Y is neither specially strong nor specially weak in any respect. On the written paper the order of merit of these three may well be, Mrs X, Mrs Y, Mrs Smith; on the practical work, Mrs Smith, Mrs Y, Mrs X; on the *viva voce*, Mrs Smith, Mrs Y, Mrs X. The final order of merit is determined by the three tests together,¹ so that the final marks will depend on the relative importance attached to the three parts

¹ In practice, the *viva voce* and written tests are usually alternative, but our hypothetical example illustrates the principle involved.

Any of the following examinations would have served our purpose in this chapter:

Certificate A Examination of the War Office,
 Matriculation Examination of London University,
 Examinations of the Associated Board of the Royal Schools of
 Music,
 Examinations of the Royal Drawing Society,
 Examinations of the Royal Horticultural Society,
 Examinations of the National Council of Domestic Science.

of the examination. Suppose one set of marks assigned are (ignoring the marks in brackets):

	Mrs Smith	Mrs X	Mrs Y
Practical	8 (8)	3 (3)	6 (6)
<i>Viva voce</i>	8 (8)	3 (3)	6 (6)
Written	3 (6)	8 (16)	6 (12)
Totals	19 (22)	14 (22)	18 (24)

Mrs Smith comes out top with nineteen marks. Let us now suppose that the written work is considered so important that the marks for it are doubled (see the marks in brackets in the table). Then, the average Mrs Y is top with twenty-four marks, and Mrs Smith and Mrs X are bracketed together second with the same marks.

This example shows that, in a class consisting of varied types of students, the emphasis placed on the different kinds of tests making up the whole examination influences the order of merit resulting from it. The more closely the tests reproduce the activities on which the students will be engaged when they have qualified, the better it will serve its purpose. This must not be taken to mean that the written paper is of no importance, for an understanding of principles and a knowledge of anatomy and physiology underlie any effective First Aid, and these are tested in the written paper. The order of merit in which the examination places the students depends on the principles adopted in marking as well as on the nature of the tests. This is an aspect of the standard of an examination which influences the students indirectly through the known results of previous examinations. If it becomes known that Mrs Smith, although good at practical First Aid work, did badly in the examination because she was not skilled in her written work, one of two results may follow. Either the Mrs Smiths will be discouraged from taking the examination, and those qualifying will tend to be mainly the 'well-educated', or the Mrs Smiths will practise written work. Which of these two happens, depends upon the facilities available for adult education. In any case, students, lecturers, and instructors tend to devote most attention to those

aspects of the work which usually have greatest weight given to them in the examination.

What are the functions of the various parts of the educational machine for the production of trained First Aiders? In the first place, it is obvious that everything depends in the long run on the students' own activity. The difference between Mrs Smith, the ordinary citizen, and Mrs Smith, the trained member of a detachment, is the result of changes in Mrs Smith's mind and body, and these changes are brought about by repeated action and concerted thought undertaken by Mrs Smith herself with the help of lecturers, instructors, textbooks, bandages, splints, and an examination.

The organisation of the classes, the selection and payment of the teachers, etc., is often undertaken by the Local Education Authority, which receives the students' fees and is ultimately responsible for the efficiency of the instruction. But, as in many other and wider branches of education, the syllabus, tradition of teaching, and conduct of the examination are entrusted (in part, at least) to independent specialists, represented in this case by the British Red Cross Society, the St John Ambulance Association, and the Medical Profession.

We have to assume that these Societies are qualified to judge what First Aiders should be able to do, and that this has been set down clearly in their textbooks, which thus define the syllabus. The functions of an examination syllabus are to define the ground to be covered and the kind of proficiency that will be expected in the examination, and to make clear what will be excluded from the examination. For example, a First Aid course omits much medical and surgical material which is outside the scope of First Aid, and experience shows that unless the students confine themselves to the limited field defined by the syllabus, their training is unsatisfactory. It is clear that much depends upon the suitability of the syllabus, on its being clearly stated and known to the students and their teachers, and on the examiner's adherence to it in letter and spirit.

The textbook is more than a syllabus. It fills in the detail, sets out the bulk of the knowledge required, and describes how the necessary skill may be obtained. (In secondary school

education it is unusual to find a single textbook which includes everything that need be known within the framework of the syllabus.) The teachers' and instructors' task is to help the students to carry out correctly the mental and physical processes required. They supplement the textbook. Although nominally bound by the syllabus, teachers are sometimes tempted to stray unnecessarily from it by their natural desire to stimulate interest. But the necessity to get their students through the examination acts as a valuable restraint on them, which may be most important to the serious student.

The examination is the linch-pin of the whole system. Through its agency the students themselves reveal the success or failure of the education process through which they have passed. Syllabus, textbook, teachers, and the organisation of classes are concerned with what *should be learnt* by the students; the examination is concerned with what *has been learnt*. In the examination, the students are brought into competition with each other. They arrange themselves in an order of merit, and on the basis of this order of merit the best students are allowed to proceed to further activity, while the superiority of the best teachers is revealed through the success of their students.

In the examination the leading role is played by the students. The teacher, if allowed to be present, may bemoan a poor display, or rejoice at a success, but he can no longer influence the performance of the task set. Elaborate syllabuses, interesting lectures, well-produced textbooks are judged by results, not appearances, now that the examination stage has been reached.

What part do the examiners play in the examination? In a properly conducted examination, they are only agents for classifying the results of previous education. They should be as powerless to affect the result as an apple-grading machine is to alter the sizes of the apples that pass through it. It is true that the examiners have a part in deciding how many of the students shall pass, but, when large numbers of students from different classes take the same examination, the decision about any one student or any one class is out of the examiners' control. The students classify themselves. We shall see in the next chapter how this comes about.

CHAPTER II

STANDARDS OF ATTAINMENT

THE question is often discussed whether every individual is capable of becoming proficient in any subject by means of training. Can all boys be taught to play the piano, to solve quadratic equations, or to fire a rifle? In Chapter I, we saw that learning is the result of practice, and that the effort required for regular practice is more easily summoned when interest is aroused and maintained. This account of the matter undoubtedly covers the majority of students. But there are always a few people with a marked aptitude for a particular kind of activity, as well as a few who take to it very hardly. Most of us can learn to play the piano with some degree of skill; a small number have the aptitude which enables them to become first-rate performers, and a few otherwise normal people encounter such difficulties that they may be said not to learn at all. As for quadratic equations, almost anyone, who wishes to do so, can learn to solve them, and even to form the equations expressing an ordinary problem; a small number have the interest, the ability, and the opportunity to persevere beyond the quadratic stage and to become professional mathematicians. In time of war, almost every man and woman can become proficient with a rifle, provided the urgency of the situation demanding such skill is sufficiently acute; but it hardly requires saying that 'some will become first-class shots, others only average.

Educational services and institutions have two tasks—to encourage and facilitate learning, and to select those likely to profit quickly from it and discard those unlikely to profit at all. The two tasks cannot be completely separated, for there is the third task of discovering and removing any factors which prevent an individual from profiting fully from education.¹ We

¹ This was brought home to me just before the war when I was being trained to fly in the Civil Air Guard. After about nine hours'

find two corresponding attitudes to examinations. In Chapter I we looked at them from the point of view of their effect on those working for them, that is, their effect on training. We saw them as a means of stimulating the students to effort and helping them past various milestones on their way towards proficiency. We touched also on their capacity for directing the teaching along certain channels, and noted the importance of planning and controlling the examinations so that these channels should be the most useful from the point of view both of the student and of society in general. We now have to consider the other, and complementary, function of examinations.

EXAMINATIONS AS A MEANS OF TESTING AND CLASSIFYING STUDENTS. A great deal of attention has been devoted during the last twenty years to the use of examinations and other tests as measuring-rods for comparing the various mental and physical characteristics of individuals. The old idea, and the one which we have stressed so far, was that examinations provided an opportunity for students to compete for rewards, thus stimulating them to effort. The new idea is that they enable the teacher or examiner to measure the student's progress or capacity, much as a farmer weighs or tests his pigs or his chickens. The boys and girls who reach a certain mental standard are set aside for some purpose, just as the best fowls or pigs may be set aside for breeding. This approach to examinations has led to research with the object of discovering how the marks allotted to the students are related to their

flying, I was given a test in judging landings, and was informed soon afterwards by the Air Ministry that, while I should no doubt learn in time, it was not worth their while to train me. A year or two later, I found that a certain weakness in my eye muscles was responsible for defective binocular vision, and that this weakness could be overcome by regular eye exercises. It seems that many prospective pilots are able to improve their binocular vision by such exercises, which, however, require perseverance. This showed me that an apparent inability to learn can be removed by suitable training—in this case, of the eye muscles.

mental characteristics or attainments, when various kinds of tests are used. It has resulted in tests being devised for comparing people on the basis of one characteristic only.

To make this clear, let us consider the results gained by students in mathematics in the School Certificate Examination. The various qualities required for a School Certificate course in mathematics may be classified as: accuracy, familiarity with the four rules of arithmetic, ability to manipulate algebraic symbols, geometrical sense, memory of geometrical propositions, and so on. The examination rewards each and all of these qualities, and candidates obtain 'credits' in mathematics if they have developed some, but not necessarily all, of them. The aim of those who have studied examinations and tests as measuring instruments is, however, to separate these various capacities and to measure them independently. They say, rightly, that a bank manager who is considering a boy for a clerkship is not helped by knowing that he has a credit in mathematics, if this credit may have been gained for good geometrical sense and facility in algebraic manipulation, and not for accuracy or skill in addition. The boy may be a brilliant mathematician but a poor bank clerk.

If the bank manager wants to know whether a boy can add columns of figures, the best plan is to set him down with a pencil and a column of figures and ask him to add them. If the employer wants to test ability to perform simple calculations of a certain type, he can give the applicant a series of such calculations. From his success or failure in performing these exercises, his suitability can be judged. It might be thought that the bank manager's task of deciding, on the result of a simple test, whether a boy can add sufficiently well to be employed in his bank, was an easy one. But it must be remembered that the boy will learn more about adding sums of money in the first month of his bank clerking than in years of school arithmetic work. The manager finds himself more concerned to guess how his prospective employee will shape after a month or two than to measure his proficiency when appointing him. Nevertheless, the addition test may be valuable, so we

will assume that it has been carried through, and that the manager is faced with a column of figures, correctly added, except for a mistake in the pence column. 'Is he to accept the boy? I have had some experience of a similar problem, being responsible for selecting undergraduates and others for temporary employment in an examining body's office. I soon found from experience that it was advisable to give the applicants a test consisting of the entering and adding of marks, work they would be called upon to do if appointed. It was not safe to assume that undergraduates possessed the qualities of neatness, ability to write clear figures, accuracy, and speed, for which we were looking. The results of the test were difficult to assess until many applicants had taken it. After several years' experience, we are now able to say that those who will become the best temporary clerks will copy and add together about a hundred candidates' marks for three papers without making any mistakes, and that those who make three mistakes become quite useful clerks, provided that their figures are well formed, and that they do not work too slowly. The point I wish to emphasise is, that, even with a simple test of this kind, one cannot lay down in advance what standard should be required to qualify; only competition between the actual applicants available enables a standard to be fixed.

This example shows that an examination or test which will select students according to their proficiency in carrying out specified activity, and hence compare their proficiency, must be devised so as to correspond as closely as possible to the limited kind of ability which it is desired to measure. In practice, the tendency has been to use what are called 'objective tests'. Instead of giving the candidate a small number of complicated tasks to perform, the examiners design a large number of short tasks, all intended to test the same kind of knowledge or ability. These short tasks can be marked by a person with little academic knowledge, since the answers are either right or wrong. The candidates can thus be placed in order of merit according to the number of correct answers they give in the time available. The tests are called 'objective tests'

because the 'subjective' judgment of the examiner is not involved in assessing a candidate's score. We shall not concern ourselves here with the particular merits or demerits of these comparatively new types of tests, but shall try to analyse the effects of their introduction on the general attitude to examinations.

A particular form of objective test is the 'group intelligence test'. This consists of a number of short tests, not designed to test a particular kind of ability or proficiency, but intended to be so generalised as to be independent of any one kind of knowledge, and thus to measure 'general intelligence'. Each task has a result which is either right or wrong, but none is supposed to require any particular previous knowledge. Intelligence testing has attracted great attention from psychologists and statisticians, and much useful work has been done that can be applied in the more general field of examinations. But concentration on the problem of measuring the results of education and innate intelligence has led to an attempt to divorce the examination or test completely from any previous training of the person to be tested. This is natural, because one of the first concerns of a scientist when making a measurement is to make sure that the act of measurement does not alter the thing to be measured. For example, when measuring a piece of elastic, one has to be careful not to stretch it; similarly, a butcher, when buying pigs by weight, has to be sure that they are not given a large meal just before going on to the scales—hence the practice of using 'dead weight'; and investigators of public opinion have to be careful to put their questions in such a way as not to affect the opinions they are seeking to collect. In the same way, the educational measurer tries to devise his machinery so that the boys and girls will not be influenced by the knowledge that they are being tested. Psychological tests are given to students in such a way that they preclude preparation.

The attempt to reduce examinations to mere measuring devices has been carried to greatest lengths in America, but its effects have been felt in England also, and have introduced

much confusion into current thought on the whole examination problem. On the other hand, it has led to the introduction of statistical methods which have been most beneficial. Examination literature published during the last twenty years has concerned itself almost entirely with the reliability of examinations as measures. For example, we have Professor Valentine's book, *The Reliability of Examinations*,¹ published in 1932. In his summary of this important enquiry, the author writes:

Nor has it been our concern to estimate all possible advantages of examinations. To do this would need a long discussion of their value as a stimulus to many pupils, as a useful guide to some teachers, as a necessary test of attainments, and so on. The contention here has been merely that there are certain grave weaknesses in the attempt to make estimates by examination even of the probable future *academic* success of the candidates; and this is a question of great practical importance, especially in view of the many scholarships awarded in schools and universities [at p. 161].

This extract summarises admirably the partial and wholly negative attitude to examinations of many who have made the closest study of them. It expresses the spirit in which the more comprehensive Hartog Enquiry was carried out a few years later by a Committee set up 'under the auspices of the Carnegie Corporation, the Carnegie Foundations, and the International Institute of Teachers' Colleges, Columbia University'.² Both these enquiries failed to achieve any important results because of their refusal to accept the fact that examinations are inseparable from the course of preparation for them. *Examination Statistics*, by Dr Crofts, is more limited in its scope, but it sets out clearly the progress made in the application of statistical and scientific methods to school examinations by the Northern Universities Joint Matriculation Board.³

¹ *The Reliability of Examinations*, by Professor C. W. Valentine, M.A., D.Phil., 1932, University of London Press.

² *The Marks of Examiners*, by Sir Philip Hartog and E. C. Rhodes, Macmillan, 1936.

³ *Secondary School Examination Statistics*, by J. M. Crofts, M.A., D.Sc. and D. Caradoc Jones, M.A., Longmans, Green and Co. Ltd.

THE FIXING OF EXAMINATION STANDARDS. Every examination or test places the candidates in competition with one another. They emerge in an order of merit as a result of this competition. An example of such an order of merit is represented in Fig. 2, which shows at A and B the distribution of the marks for two Mathematics examinations taken by twelve students. Each square represents a candidate and shows, by its position, the number of marks obtained by that candidate. We note that the standard of difficulty of the second examination was greater than that of the first.

When an examination is taken by a larger number of candidates, the distribution graph gives a better picture of the nature of the paper in relation to the candidates taking it. For example, Fig. 1 shows the mark distributions for three different School Certificate papers. Fig. 1, A shows 961 of the 3289 girls who took Arithmetic in 1930; B and C show the Arithmetic of 967 boys and 1041 girls in 1942; and D shows the Geometry of 909 boys in 1929. Paper A was a suitable test for the girls who took it, in the sense that it distributed their marks well over the range. The Arithmetic papers set in July 1942 proved to be rather too easy (38 boys and 21 girls got full marks)—the result of a demand from the teachers for easy papers under war conditions. The December 1929 Geometry paper was much too difficult for the boys who took it (only 61 could get 60 marks or over, and 7 got 0). It will be noted that, by counting the squares to the left of (say) the 30 mark line, we can tell at once how many candidates were below this level on any paper. The vertical lines in the diagrams divide off the best quarter and the weakest quarter of the candidates from the middle half. The marks corresponding to these lines are called the upper and lower quartiles respectively; they provide important information about the paper.

From the point of view of the examining body classifying students, the distribution A is the most satisfactory. The 1942 paper (B and C) was unsuitable because it failed to differentiate between the best students. It is interesting to notice that the boys were better than the girls in this subject. The Geometry

paper D made it difficult to differentiate between the weaker students, who were all placed in the position of being unable to do the paper effectively at all. On the other hand, sixty students who might all have been within a mark or two of full marks on an easy paper, such as the 1942 Arithmetic paper, were strung out over a range of 30 marks according to their relative ability to answer the paper. The paper was, therefore, good for differentiating between the best candidates.

When we have the candidates arranged in an order of merit, how are the pass standards to be decided? Let us imagine a terminal examination in mathematics in one of the Fourth Forms of a large secondary school. The examination paper is set by a teacher of another form in the same school, but the scripts are marked by the candidates' own teacher. These two teachers thus act as joint examiners. We will assume that a prize is to be awarded to the best student, and that any students who 'fail' will be kept back in the same form for another term, instead of being promoted to the Fifth Form. We note first that there is a suitable reward associated with success for the best and the weaker members of the class. By consultation with the class teacher, the examiner, who sets the questions, sees that they are 'within the powers' of the students. We will suppose that there are twelve students, and that the following marks out of a maximum of 100 are assigned: 80, 62, 59, 58, 55, 49, 48, 46, 45, 42, 39, and 30 (see Distribution A, in Fig. 2). The two examiners have to decide which students are to fail. This question has two lines of approach. One is furnished by the marks, and the other by considerations of policy. Looking at the marks, the examiners may feel satisfied that the first nine students should pass and the three at the bottom of the list should fail. There is a popular impression that, in examinations, 33 marks out of 100 is the pass mark, but we will assume that our teachers, being experienced examiners, attach little importance to such an arbitrary rule. The dependence of the marks allotted on the questions set is revealed if we imagine some of the latter to be altered. Suppose, for example, that instead of a simple algebraic equation of a standard type, an

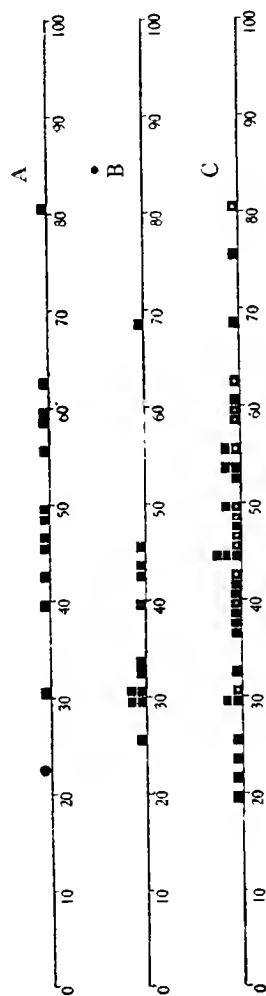


Fig. 2.

unusual type had been set; that one of the arithmetic sums and one of the geometry riders had been made more difficult, and that some other questions had been stiffened. The marks might then have been 68, 45, 43, 42, 39, 33, 32, 30, 30, 29, 29, and 25 (see B, in Fig. 2). A pass mark fixed arbitrarily at 33 produces more failures on this more difficult paper, yet one cannot say that one set of marks gives a correct, and the other an incorrect, valuation of the candidates. The result is also affected by the method of marking adopted; for one examiner may be naturally generous, while another is naturally sparing in the allotment of marks, though both are consistent as between candidate and candidate. The form teacher may, of course, have definite ideas as to which students should pass, based on his experience of them over a period, but arbitrary rules based solely on the marks awarded, even when supplemented by the general impressions of the teachers, are not sufficient to fix pass marks. The pass mark expresses the policy of those controlling the examination. In the example we have chosen, this policy has to take into account two considerations: first, the effect of the examination result on the work of future students; secondly, the effect of the result on school organisation. With regard to the first consideration, we cannot leave out of account the results of the corresponding examinations held in previous years. Every series of examinations gives rise to a tradition based on the proportions of candidates who have passed and failed on previous occasions. Maintenance of this tradition is an important part of the examiners' policy; but it has to be reconciled with the other part of their policy, which is to serve the ends of school organisation. If there is room for only ten students in the higher form, then only ten can be allowed to pass the examination.

Let us now suppose that the examination is differently arranged, so that three parallel forms, taught by three separate teachers, take a single examination, which is set jointly by the three teachers, or by an independent teacher. We will suppose that the marking is done by one person, preferably not one of the teachers of the classes concerned. The marks of our original

class now have to be considered in relation to those of the other two classes. Assuming that the easier of the two question papers is used, the marks (in groups of five) will perhaps work out as follows:

Marks	No. obtaining those marks	including 1 from our class		
Over 70	2			
65-69	1	„	0	„
60-64	2	„	1	„
55-59	4	„	3	„
50-54	3	„	0	„
45-49	6	„	4	„
40-44	6	„	1	„
35-39	4	„	1	„
30-34	2	„	1	„
25-29	3	„	0	„
20-24	2	„	0	„
Below 20	1	„	0	„
	<hr/> 36		<hr/> 12	

The distribution C in Fig. 2 shows the actual marks; the white-dotted squares represent students from our form; the black squares, students from the other two forms.

Our twelve students now take their places among the whole thirty-six. They prove to have done better in the examination than those from the other two forms, for only three out of the twelve have obtained less than 45 marks; whereas, out of the whole thirty-six, eighteen are below this level. The tradition about the proportion of students passing now takes on a new meaning; it can be strictly maintained without being unfair to one form that has proved to be above the average. Even if it is known that there are only twenty-seven vacancies for the thirty-six students, the weakest member of every form knows that he has a chance of promotion. In fact, a pass standard based on the number of vacancies proves to be more satisfactory than any arbitrarily fixed pass mark.

CAN ABSOLUTE STANDARDS OF ATTAINMENT BE DEFINED? A pair of scales compares the weights of different objects. What does an examination compare? It compares the degree of success with which different students have carried out a course of activity. This 'degree of success' can be called *standard of attainment*. We must remember that a student's standard of attainment in a particular examination depends upon a number of factors including his natural ability, his previous education, his application to the course of study, the quality of his textbooks, and the skill and devotion of his teachers. The method of comparison is direct competition in the performance of suitable assigned tasks, judged in accordance with agreed rules. To attempt to make this comparison without direct competition is like attempting to compare the weights of two objects without placing them on the scales. Similarly, the standard of difficulty of two examination papers in the same subject can be compared by letting them be taken by the same set of students within a short period.

In this sense we can say that the standards of attainment of two students in the field covered by a given examination or part of an examination are the same when they get the same marks in that examination; and the pass standard is the standard of attainment of those who are awarded the pass mark. Two papers are equally difficult when the same set of candidates obtains the same average marks for each.

The fact that there is no simple direct method¹ of comparing the standards of attainment of candidates taking different papers on the same subject has made possible the fiction that a pass standard is defined in some 'absolute' manner independently of the candidates. We shall now discuss some of the difficulties created by this fallacious idea.

We can distinguish several different methods of assigning

¹ This leaves out of account the method of standardising two papers by letting them both be taken by the same set of students, and adjusting the marks for all other students accordingly. This is quite practicable, but it is a refinement that does not affect the popular idea about standards.

marks to the work done by candidates in answer to a question or in response to a test:

(1) In translation from one language to another, or in dictation, the examiner may deduct one or more marks from some arbitrary maximum for each mistake made by the candidate.

(2) In mathematics, a certain number of marks may be allotted to each step in a sum, and the candidates credited with the marks for each step done correctly.

(3) In objective tests and in some science or geography answers, marks may be allotted to each of the points that should, or might be, mentioned, and the candidate credited with the marks for the points he states correctly.

(4) In some literature and science answers, the examiner may reckon in his mind the proportion of the correct answer given by a candidate and may assign a corresponding fraction of the possible marks.

(5) In most essay type answers, drawings, etc., the examiner may make a mental comparison of each candidate's work with certain 'standard' answers, such as 'pass', 'good', 'distinction' (often denoted by A+, A-, B+, B-, C, etc.), which he carries in his head, or has by him for reference.

The first three of these methods of marking do not give the examiner the illusion of an abstract, fixed, pass standard. At least, if he envisages such a standard, his marks give him little indication which students have reached it, as they are so obviously governed by the particular test set.

The last two methods, however, lend themselves to the idea of an absolute standard of performance, independent of both the test or questions set and the candidates. Subjects marked by these two methods are said to be marked 'by impression', while subjects marked by the first three methods are said to be marked 'objectively', or 'according to a scheme'. Objective marking does not pretend to do more than arrange the candidates in an order of merit. The marks of any individual candidate are recognised to have no significance except in relation to those of other candidates. It is true that examiners

sometimes adjust their scheme of objective marking to produce an average or pass mark near some predetermined level (say 50 marks), when they have discovered, during the marking of the papers, what marks the candidates are obtaining. This can be done in translation or dictation by altering the number of marks to be deducted for each mistake—more being deducted with an easy passage than with a difficult one. And, in the case of mathematics, the proportion of marks allotted to difficult and easy steps can be varied when the candidates have shown the examiner how difficult the paper has proved. Similar adjustments can be made when marking 'by points'. But these are merely devices for obscuring the dependence of the original marks on the particular tests set and the method of marking used.

When using the fourth method of marking, many people imagine that marks have an absolute value, because of their relation to the possible full marks. This is seen to be wrong when one remembers that the intrinsic difficulty of the task has also to be taken into account. While writing this section, I happened to listen to an 'A.R.P. Quizz' on the wireless, which took the form of a contest between teams from Birmingham and Southampton. The participants were asked questions by the 'Question-Master', and their answers were assessed out of a maximum of five by an independent expert. It soon became clear that two-and-a-half marks for a half-correct answer were much more easily earned on some questions than on others.

Our fifth method of marking—by comparison with a set of standards—is the most plausible way of obtaining a series of marks related to an absolute standard. Let us consider the School Certificate subject, 'Art', in which the examiner has to assign marks to a number of drawings. We will suppose that he has to guide him a set of drawings selected from the weakest of those classified as 'pass', 'credit', and 'very good', respectively, in previous examinations and kept as standards. He then compares the work of every candidate with these standards and assigns marks accordingly. The first point to be

noted is that the 'standard' drawings were selected after pass marks had been fixed by the Examining Board as the result of a statistical analysis of the marks, and in accordance with their general policy. The standards (whether carried in the examiner's head, or actual drawings) represent levels of achievement that past experience has shown to be within the powers of a reasonable number of candidates. Secondly, we must note that no two drawing tests are equally difficult. Thus experienced artists may consider that the drawing of a chair and table, made by one candidate in 1943, is 'equal in merit' to the drawing of a group of gardening tools made by another in 1942, but it does not follow that these two children will have received the same marks for their drawings in the years when they were examined, although their attainments were correctly assessed. We have to look on the comparison of drawings with standard drawings merely as a means of assigning a mark on the basis of which the drawings can be placed in an order of merit. Generally speaking, when examiners are marking 'by impression', they carry comparison standards in their heads, that is to say, standards at which they have arrived as the result of experience in assessing large numbers of answers, and which are dependent, therefore, on the general ability of the students and are not independent of it. It is not surprising that examiners often imagine their comparison standards to be unique.¹

¹ Many people imagine that a judgment made 'by impression' has a peculiar sanctity. This is quite unjustified. An 'impression' judgment made by a well-balanced, experienced person is the result of accumulated experience or of rapid mental assessment of various points, and should be given neither more nor less weight than a judgment made by the same person after careful thought and analysis.

Many experienced examiners begin marking a series of answers by drawing up a careful scheme in which so many marks are allotted to this point and so many to that, and they repeatedly compare an answer with others already marked. But, after marking a few hundred answers, they are able to take all the points of their marking scheme into account by means of an intuitive judgment, which takes account also of the marks known to have been assigned to other typical answers. Examiners have often told me that they have returned to look over answers marked in this way, and have found that the marks assigned were strictly in accordance with the scheme.

It is interesting to note that the authors of *The Marks of Examiners*¹ try to define an absolute standard, although the main part of their book is devoted to proving the relative nature of examination marks. They fall back on what they call 'utilisable skill'. They write in the preface:

The examinations of which the purpose is the most clearly defined are technical examinations of which the aim is to determine whether a candidate has or has not a definite utilisable skill. Certain statistical considerations which, as we shall see, play a great part in some other examinations, are reduced here to a minor role. When qualifying examinations are held on the work of an actuary, an accountant, a surgeon, an air pilot, a motor driver, or a shorthand typist, experienced examiners are as ready to examine a single candidate as to examine fifty, and to say whether he is or is not suitable for his particular job. If there are, say, twenty candidates, the examiners may pass or plough the whole twenty. The examiners have an acute sense of responsibility to the general public. The exact percentage of marks required for a 'pass' is here of comparatively little consequence. Where, as is generally the case, a test is a complex one made up of a number of tests, it is the duty of examiners to see that if, say, by an accumulation of marks for points of minor importance, that percentage has been allotted in the first instance to a candidate judged on the whole to be unfit for his job, it shall be reduced below the borderline for a pass [at p. xvi].

The first assumption here is that there is a definite standard of attainment such that a candidate below this standard is unfit to enter upon a certain profession, while a candidate above it can safely be let loose on the general public with his statistics, accounts, operating knife, aeroplane, motor car or pencil and typewriter, as the case may be. Very little thought is needed to see that this definition of a 'utilisable skill' is anything but definite. A shorthand typist may have a 'utilisable skill' judged by the standards of some employers, but fall far below the requirements of an office in which high-class work is done. And the best shorthand writers from the high-class office might be useless if required to take verbatim reports of speeches in the House of Commons. The same applies to the surgeon, and

¹ See footnote 2, p. 27.

to all the other examples quoted. 'Utilisable skill' is a meaningless phrase when divorced from the practical world. In this practical world the standard of skill regarded as utilisable depends upon the degree of skill shown by actual applicants for the posts under consideration; it is defined as a result of competition.

The second assumption in the above quotation is that the examiner has some means of defining a standard of skill without reference to any actual candidates, i.e. one which remains valid over a period of years. As we have already seen, this is not so. In typewriting, one can say that a candidate who can copy a certain number of words per minute from a certain book on a certain make of machine without making any mistakes has attained a certain skill. But some candidates may have been practising from this book and therefore be less skilled than appears; others may be unfamiliar with this particular kind of machine. Again, the ability to copy the kind of prose to be found in this particular book may be no guarantee that the candidate has a utilisable skill for work involving much tabulating; so that it becomes necessary to introduce a test involving tabulating as well as copying. Again, punctuation is part of a good typist's equipment, and so is ability to decipher difficult manuscript. If all these points are to be taken into account, the definition of a standard of skill becomes more complex.

The reader will find, if he tries, that the search for an absolute standard of skill is a fruitless one. Let us take what might seem a most favourable example—the sports event 'throwing the cricket ball'—in which a standard can be defined as the ability to throw a cricket ball at least fifty yards in one of three throws. Clearly, all those who can do this pass the test; those who cannot, fail the test. But it has been necessary to select an example unrelated to employment in the actual world. Let this throwing of a cricket ball be related to a game of cricket, and it is found to be of little value as a utilisable skill, for many other factors are required to make a good fielder.

Sir Philip Hartog's Committee has done valuable work in showing the difficulties of arranging and carrying through a 'fair' examination, but they have failed in this publication to explain the place of external examinations in the educational system. One of the reasons for this is their failure fully to explain the essentially relative nature of examination standards.¹ While they recognise that many more examinations are competitive than is generally realised, they try to find an absolute with which to compare the relative standards fixed by the examiners. In selecting 'utilisable skill' as a peg for their standards, they have, in fact, hit on the exact reverse of the truth, for experience shows that absolute standards of attainment or of skill have been able to sustain their perilous existence only in so far as they represent something *not utilisable*, something cut off from the living, changing, world into which the students have to pass. Greek is a subject in which the fiction of an absolute standard can be maintained, because it is a dead language, and therefore unchanging in itself. The study of classical Greek is cut off from the ebb and flow of popularity and political thought with which modern language teaching has to contend. The teaching methods remain fixed, whereas those in modern languages are continually developing. If there were a great increase in the facilities for students to visit foreign countries, existing standards of attainment in modern language examinations would be swept away, and their place taken by new standards suited to the requirements of the situation. Any comparable change in relation to classics would force an alteration of standards.

It would be wrong to suggest that examining bodies do not think at all in terms of a definable standard of performance; but they have to accept the position that its statement in terms of marks is something that cannot be carried over from one examination to another, or from one question paper to another

¹ A much greater insight into the true function of examinations is shown by Sir Michael Sadler in his contribution to the Committee's volume, *Essays on Examinations*. Reference to this essay is made on p. 88.

unless a certain number of candidates take both. For example, only an approximate answer can be given to the question, 'Has the standard of School Certificate mathematics risen or fallen as a result of the war?' We could try to answer the question by keeping a number of marked scripts (answer papers) sent up in 1939, and arranging for a number (say 200) of 1943 candidates to take the 1939 mathematics question papers as well as the 1943 papers. With the help of the 1939 marked scripts which have been kept for four years, examiners could assign marks on the 1939 level to these 200 1943 candidates. It could then be noted how the marks of the 200 candidates on the 1939 paper compared with the average of all the 1939 candidates' marks, and also how the marks of these 200 candidates on the 1943 paper compared with the average of all the 1943 candidates on the 1943 papers. The batch of candidates who had taken both papers would thus provide an indirect means of comparing the average work of all candidates in 1939 with the average work of all candidates in 1943. It is worth noting that the comparison depends upon actual flesh and blood candidates for its success.

Even this elaborate procedure is open to some objections. Thus, the style of mathematics question papers has probably changed slightly since 1939, so that 1943 candidates, having prepared for 1943 papers, might not do themselves justice on the old type of papers. Precautions would also have to be taken to ensure that none of the candidates had worked through the 1939 papers as a preparation for the 1943 examination.

An allied problem is to compare the work of the same candidate in two successive years. This can be done with some certainty if the average standard of the mass of candidates in each year is taken to be the same. If this basis for comparison is denied, a difficult problem presents itself. It might be argued that these problems could be solved by recourse to objective type tests which were kept secret from teachers and pupils. But it would be necessary to make sure that the tests corresponded to the kind of work that was being done in the schools on each

occasion, and could therefore be taken as a true measure of that work.

The policy of the examining bodies in relation to School Certificate subjects is to give credit to about half the candidates. The question is often asked, 'What happens if there is a general rise or fall in the standard of work in the schools?' Suppose, for example, that, as a result of the war, every geography teacher and every child becomes more geography-conscious, so that a greater amount of knowledge is shown by everyone, and the marks obtained in the examination in this subject are higher. Ought the examining bodies to allow more children to obtain credits? Very little thought is required to see that unless the standard for 'pass' is raised to correspond with the improved standard of work, the examination ceases to fulfil either its function of providing a stimulus, or its function of selecting children for entry into the professions or for further education. Boys and girls will stop caring very much about their geography if they can pass the examination by reading the newspapers. The fact that they are reading the papers does not entitle those taking geography to a university education before candidates who have been doing (say) physics under the difficulties—shortage of laboratories and physics teachers—caused by the war. We find, in fact, that the standard of an examination adjusts itself to the standard of those taking it. This applies both to the standard of questions and to the standard of result expected. It is true that an examining body may try, by reducing the number of passes, to maintain the standard of result in spite of a falling off of knowledge in the schools, but there is no evidence that examinations can undo the effects of shortage of teachers or inadequate time-table allowance, accommodation, etc.

The Cambridge School Certificate Examination provides some interesting illustrations of the difficulties of fixing standards. The question papers set in December of each year correspond closely to those set in the previous July. The bulk of the candidates in England are entered for the July examina-

tion, but, a small number take the December examination, which is mainly for candidates from India, East and West Africa, the West Indies, and (until 1942) Malaya. The small number of December candidates in England is partly made up of those who fail to pass or to get the exemptions they desire in July, and partly of candidates from schools which work on the basis of a December rather than a July examination. These candidates' scripts are marked in December, and their results are announced in January. The scripts from the large number of Oversea candidates do not arrive until the results for Home schools have been published. The examining body is thus faced with the problem of determining standards for a small number of candidates before the bulk of the scripts have been marked. The standard in England can be said to be determined by the July examination, and this is done, in the main, by reference to the proportion of the candidates reaching credit and pass standards. The standard at Oversea schools can similarly be gauged by the results of the large numbers of candidates. For example, all the secondary schools in Malaya used to take the examination, so one might expect the same proportion of these three thousand candidates to obtain credits in any subject from year to year. The same might be said of nearly three thousand candidates from the West Indies, or from Africa. Comparison over a period of years of the performance of these various parts of the world has provided an opportunity for judging the nature of examination standards. These examinations give a reliable means of comparing the work in the different regions, but this depends upon the fact that the candidates all take *the same papers* marked by *the same examiners*. The constancy of the Cambridge standards in the December Oversea examination is not the result of any uncanny judgment on the part of the Cambridge examiners, but of the large numbers taking the examination from all over the world.

The examining body's object is threefold: (1) to maintain satisfactory standards in the July examination from year to year in conformity with the other seven examining bodies; (2) to maintain suitable stable standards Overseas in December;

(3) to keep the December (Overseas) standards in line with the July (Home) standards, so that a boy who has prepared for the examination will have the same chance of passing whether he takes the examination in England in July or in India in December. The only reliable link between July and December is provided by the candidates who take the examination in England in July and again in December. Calculations over a period of years indicate that these candidates improve their performance in each subject by 6-8 standardised marks out of 100. Those who take a single subject only in December show a greater improvement than this; and candidates who passed with credit in a subject in July show less improvement in that subject (about $1\frac{1}{2}$ marks). I have been informed that another examining body has obtained similar figures.

The sequence of events for the examining body is, therefore: (1) in August, when the July scripts have been marked, to fix standards in each subject; (2) in January, when the December Home scripts have been marked, to fix standards with the object of making them equivalent to the July standards (in addition to the 'improvement statistics' of candidates taking both examinations, evidence for fixing these standards is available from the impressions of the examiners and the constancy of the percentages of credits in the December (Home) examinations); (3) in February or March, to check the December standards by the percentages of Oversea candidates gaining credits. It is noteworthy that the percentage of credits in the various Oversea areas varies considerably, and differs from those in England in July. For any given area with a large number of candidates, these percentages are fairly constant, however, from year to year. Sometimes it is necessary to alter slightly the standard fixed for the few candidates at Home when the thousands of scripts from Overseas have been marked. These problems are mentioned in order to show that fixing examination standards is no easy task.

The following passage from a Higher School Certificate candidate's essay illustrates the prevalent confusion of thought

on the subject of examination standards: '*All children should go to an elementary school until the age of eleven, when they should take an examination—all those who get above a certain percentage of the maximum marks should then go to a secondary school. This way is much fairer than taking, say, the "top twelve"*.' It seems doubtful whether this boy understood that the power of an examination to fix a satisfactory standard of attainment depends upon the competition which he wishes to avoid. When students from a single class have their own examination, they know that they are competing with one another. When they take an examination which covers thousands of other candidates, they realise that their competition with one another becomes of minor importance compared with their relationship to the mass of other candidates. This expresses itself concretely in the relationship of their marks to the pass mark. The effort to exceed the pass mark replaces the effort to surpass one another. The pass mark becomes the embodiment of the work of all the other candidates. The writer of the essay is expressing an important truth when he says that admission to the secondary school should be based on a standard and not on competition between a small number for a smaller number of vacancies, but he has failed to understand that, unless every child is promoted, promotion depends on competition and on the number of places made available by the Education Authority.

Let us now compare the problem of fixing standards presented by the Fourth Form mathematics examination and the Cambridge December School Certificate Examination with the attitude of the psychological tester. The psychologists are not concerned with policy. They wish merely to express the ability or progress of a set of children in terms of some standard. They give the children a test that will place them in an order, such that those high in the order have the quality to be measured in greater degree than those below them. In order to define a standard the *same test* is given to a large number (say 1000) of children of similar age and background. The 'scores' of these 1000 children, when analysed statistically, provide the tester with 'norms' with which to compare any one child or any small group of children. For example, a child

who obtains the same score as the 500th in order of merit out of 1000 can be said to possess the quality being measured in average degree; a child who obtains the same score as the 100th in order out of 1000 is said to be in the 10th percentile group. In this way the 1000 children provide standards with which any individual can be compared.¹

The pass standard in an examination cannot, however, be defined merely by reference to the average performance of a large number of typical students. This average certainly provides a stable basis for any decision, but we cannot avoid the responsibility for fixing the number of passes on the basis of policy. The Fourth Form examination takes on a greater stability when it is taken by the three parallel forms, but the pass standard does not fix itself. At the same time, purely statistical comparisons have provided a valuable method of comparing standards in examinations taken by different candidates. *Provided it can be assumed that the general conditions of teaching and study and the innate ability of the students are the same on the average for the two sets of candidates, and provided the numbers are sufficiently large*, we can say that standards which allow the same proportion of candidates in the examinations to pass are equivalent. This is a valuable method of comparing standards, and is used for equating the standards of the various examining bodies in England, but it is essential to make sure that the above conditions are fulfilled.² The method is also used in one

¹ A man makes a similar comparison when he stands on a weighing machine, places a penny in the slot, and then compares the reading on the scale with the average weight for his sex, age, and height given on the table. The importance of the average is, however, much greater for the educational measurer than in the measurement of weights. We already have a standard weight in the pound avoirdupois, and can measure the average weight of 30-year-old men, 5 ft. 10 in. high, in terms of this pound. But the educationist, having no independent standard, has to make all his measurements in terms of an average.

² For a fuller account of the difficulties involved in comparing the standards of different examinations, reference should be made to the *Investigators' Higher School Certificate Report* (see footnote on p. 113), especially par. 22, pp. 17-20.

form or another by most of the examining bodies within their own examinations, but it must be used with caution and skill.

Although the application of statistical methods to psychological testing and thence to examinations has proved to be of great value, it is liable to produce a mechanical approach to the whole subject. People trained in the physical sciences are sometimes tempted to seek simple laws governing educational measurements similar to the laws of physics. This attitude is well summarised in the last paragraph of a recent book, in which the author expresses his hopes and expectations in this direction:¹

I have no suggestions to make as to what a possible law in education might be. But some laws will have to be obtained. It may be urged that throughout this chapter I have assumed that measurement in education must be similar to measurement in physics and that such an assumption need not be true. But it is true. In the last few years we have seen how the borderline between physics and chemistry has been completely removed, and it is becoming increasingly clear that wherever measurements can be applied, there the methods of physics are appropriate. Indeed physics can almost be defined as the science of measurement. It is here that the Behaviourists with their emphasis on the behavioural responses of the individual have made their most valuable contribution to educational psychology. If there is to be a science of educational measurement at all, then these behavioural responses must be found to obey numerical laws, such that the constants occurring therein order the individuals in the same way as psychological properties. From the obvious health of educational research to-day it is not likely to be long before some such laws are discovered, and I have little doubt that they will be found to justify much of the work that has already been done [at pp. 146, 147].

Whatever the future holds for intelligence testing, this attitude to examinations must be deplored, since it would reduce what is in fact one of the most potent instruments of progress in human society to the level of inanimate nature.

I wish to make it clear that I do not underestimate the value of statistical methods in examination technique. On the contrary, I think that without them it is impossible to devise

¹ *Truth and Fallacy in Educational Theory*, by Charles D. Hardie, Cambridge University Press, 1942.

an examination which satisfies the primary condition of being 'fair'. Statistics in the examination world should be seen, however, as an instrument of policy; any attempt to use them to make examinations conform to abstract laws would be disastrous.

We complete this chapter with a quotation from an American book on examinations which covers some of the ground we have been considering.¹ Although the authors fall into the prevalent error of regarding examinations as measuring-rods only, they stress many points of importance. It will be seen that those responsible for examinations in America have to contend with the idea that examination pass marks (or, as they call them, 'passing grades') have been fixed by some all-wise authority at 60 or 70 per cent of the maximum. In England there is a popular belief that 33½ per cent is the figure, although 40 to 50 per cent is usual in our present school examinations. The phraseology of this quotation is unfamiliar to us, but we can take 'achievement test' to mean 'examination', 'scores' to mean 'marks', and 'test' to mean 'question':

The concept of the 'passing grade', expressed as a per cent of possible or 'perfect' performance on a test, is one of the most unfortunate of our inheritances from traditional examination practices. This concept has served only to confuse many of the real issues in general achievement test construction.... The position of a 'passing grade' along a scale of possible scores on a general achievement test is *completely irrelevant* to the task of general achievement test construction. The problem for the test constructor is to discriminate between pupils in what they actually have achieved, regardless of how what they *have* achieved relates to what they presumably should have achieved. The position of the passing grade must always be arbitrarily and independently determined, not in terms of the *per cent* of items answered correctly in a given test, but in terms of a description of the detailed items of achievement which collectively represent the minimum of 'satisfactory' achievement in the subject or course involved. Whether 10, 70, or 90 per cent of the pupils exceed that

¹ *The Construction and Use of Achievement Examinations*, prepared under the auspices of a Committee of the American Council on Education, Harrap.

score has no bearing whatsoever on the effectiveness of the test for *ranking* pupils in the order of their actual total achievement.

If there were available for a given course a detailed description of the specific elements of achievement which individually and collectively are considered *essential* to promotion, and if each, or if a random sample, of these elements could be measured by separate test items, then a 'passing grade' could be meaningfully described, but in this case it would be *at or near 100 per cent*, and not at 60, 70, or 75 per cent. That is, a pupil would deserve promotion only if he had mastered *all* of the minimum essentials for promotion. Such a 'mastery' test, however, would be of little or no value for discriminating between pupils at different levels of achievement above the minimum, since presumably it would result in perfect or near perfect scores for most of the pupils. In other words, such a 'mastery' test would not be considered a general achievement test as here defined. While such tests might be desirable, there are few if any high school or college courses for which the 'minimum essentials' have been authoritatively described in a form sufficiently specific to make possible the construction of such tests. For this reason alone, if for no other, the idea of an absolute standard and of grades or scores with absolute meaning must be abandoned. Other considerations point to the same conclusion [at pp. 35, 36].

The rigidity or laxity of the 'standards' employed, furthermore, is in no way indicated by the point at which the passing grade is set. If the passing grade is set at 60 per cent, the teacher will adjust the difficulty of the test or the method of scoring it so that what he considers the 'proper' proportion of students will exceed that score. If it were set at 75 per cent, he would see to it that the same number of pupils would 'pass'. Under this system, such results are inevitable. In the absence of any authoritative, specific description of minimum essentials, the teacher must decide subjectively, in terms of the students' relative (not absolute) test performance and on other bases, which students should 'fail'...

In assigning per cent grades with reference to an arbitrary 'standard' in any test, we are in large measure only deluding ourselves to no particular advantage. The per cent system appears to set absolute standards and to result in scores which are comparable from test to test, but in reality it does not. Scores on general achievement tests, whether of the essay or the objective type, can only have relative meaning, and the system of scoring should be consistent with this truth [at pp. 37, 38].

CHAPTER III

LINKS IN EDUCATION

INTERNAL AND EXTERNAL EXAMINATIONS. These two terms are used freely in educational literature, but often without a clear appreciation of their meaning. We shall define an *external* examination as follows: *An examination is external in relation to any given form or school when the same questions are answered by the pupils of this form or school and by the pupils of other forms or schools; and when the results are issued in such a manner that the relative performance of the pupils of the different forms or schools can be directly compared.* An *internal* examination is then seen to be an examination arranged for a single form or school which does not bring its pupils into direct competition with the pupils of other classes or schools.

The definition does not say whether or not the examination is conducted by an outside body. The peculiar characteristics of internal and external examinations appear to be independent of this factor. We have seen that an examination places the candidates in competition with one another. When these candidates are taught in one class, this competition involves only the members of the class; but when two classes take the same examination, their teachers are also brought into competition with each other. To make this clear, let us compare the two Fourth Form mathematics examinations described in the last chapter (pp. 29-34). The first, according to our definition, was *internal*, and the second, *external*, in relation to one form. In the internal examination the competent form teacher has only a limited interest in the results. Although he may not conduct the examination himself, he knows that it is largely a matter of opinion or policy how many boys are allowed to pass. If there are many failures, he is unlikely to consider himself to blame. He tends to associate himself either with the examiner or with his pupils. In the first case he may say, 'this is a weak batch of boys'; in the second case, he may say that

the questions were too difficult, the marking too severe, or the standard expected too high. The examination remains internal whoever sets the paper, whoever marks the answers, and whoever settles the pass standard. An internal examination places the boys on their mettle *vis-à-vis* one another, and unites them *vis-à-vis* the examiner. It creates no relationship with the boys in other classes, although each class has a similar examination.

The *external* examination described on p. 34 produces a different situation. It brings the boys into competition with those from other classes. It puts the whole class on its mettle *vis-à-vis* the other classes, and creates a common tie between the three classes. The teachers are forced to adopt a different attitude to such an examination. They may still claim that their particular boys are a weak lot, but everyone now recognises that there is a common standard of comparison. The pupils themselves can compare the teachers, by comparing their own degree of success with that of pupils in the other classes. This examination is *external* in its relationship to any given class, but, of course, is *internal* in relation to the school as a whole. It creates a connection between the three class teachers, but no connection with the teachers in other schools. The 'externalness'¹ of the examination remains, whatever arrangements are made for setting the questions, marking the answers, or settling the standards. It depends merely on the fact that a relationship of direct competition is set up between the boys in the various classes.

Popular Conception of the term 'External Examination'. Many people think that any examination conducted by an outside body is an external examination. The following example will serve to demonstrate the unhelpfulness of this popular conception and the value of our definition. For several years I was responsible for arranging in England examinations which were to be taken by the lower forms of an important school in one of the colonies. Scholarships were awarded to the two or

¹ I avoid the word 'externality' because it is so often used to denote only the bad features of external examinations.

three boys at the top of each form, and there was a rule that, in order to compete for the scholarships, the boys must not 'fail' in more than one or two subjects. We were supplied with printed schedules in each subject showing what ground was to be covered by each class. The examiners set papers of questions based on these schedules. The papers were printed in England and sent overseas. The boys wrote their answers under the supervision of the school authorities at the end of the school year, and the answer scripts were returned to England and sent to the various examiners to be corrected. The examiners were required to fix a pass mark for each class in each subject, and the final marks and reports on the work were sent to the school. Here we had a case of what was at first sight the most *external* of examinations, whereas, in reality, it was an *internal* examination held under the most unsatisfactory conditions. The teachers had no word in setting the questions, and the examiners had no direct knowledge of the standard or conditions of the work. It was a most difficult task to secure fairness in the setting of the papers, and in fixing the pass standard all the difficulties of an internal examination were present, because no student was brought into competition with anyone outside his own particular class. The scheme was adopted to ensure a crude kind of independence in the award of scholarships. It gave examiners in England an opportunity of expressing an opinion on the work sent in, but, at best, the results obtained were no better than they would have been if teachers in the school had carried out the examinations. Whatever pains the examiners took, it was impossible to be sure that the questions were really suitable, and I formed the opinion that the examination was not satisfactory as a means of judging the general standard of work in the school. What value it had was due entirely to the experience which the examiners had gained, either as teachers in schools in England or through marking work of a similar standard. I may add that the examination is now conducted by the school itself.

We can show the difference between internal and external examinations more clearly by considering extreme forms of

each. The most common internal examination is the test given by a teacher to his own students informally as part of his system of teaching. The questions are then definitely on the work which has been done in class; if some item has been omitted from the course, it is omitted also from the test. No choice of questions is necessary, because every student has had the same opportunities. The students are under no kind of strain. They recognise the test as a normal part of their work. The phraseology of the questions corresponds to that of the teaching. The students are not called upon to make particular efforts on their own account to supplement what they have been taught.

An extreme form of external examination is one covering a wide syllabus but without a choice of questions, so that every student has exactly the same tasks to perform.¹ This eases the work of the examiner, but introduces an element of luck, because some teachers may have dealt with all the items covered by the questions and some may not have been so fortunate. If much depends on the results of the examination, this uncertainty creates a strain, especially for some types of students. They have to try to cover every point on which a question may be asked. Questions may contain words unfamiliar to some students, who may thus misunderstand the examiner's intention.

While completely internal examinations are often used in schools, completely external examinations are rare, for an examination which includes a choice of subjects or a choice of questions within subjects cannot, according to our definition, be called fully external. The choice is designed to allow candidates taught under different conditions and by different teachers some freedom in their treatment of the subjects as well as a choice of subjects.

Choice within an Examination. Examinations vary greatly in the choice of questions allowed to the students. This choice is related to the extent of the examiners' knowledge of the detailed syllabus and methods of teaching used in the various

¹ We are not considering papers consisting of a large number of compulsory questions requiring only very short answers.

schools, and thus depends, in an external examination, on the degree of definiteness of the common syllabus which is in the hands of teachers and examiners. In some examinations the syllabus consists of a prescribed textbook which must be known by all students and outside which the examiners may not go in selecting questions. In examinations of this kind a choice of questions reduces the standard of the test. The syllabus is so framed in some external examinations that it leaves latitude for different teachers to treat the subject in quite different ways. In this case, a choice of questions is most necessary, unless the examination is to be unfair to certain schools or students. In internal examinations where all the students are taught under the same conditions, a choice is less necessary. If granted, it leaves the students free to neglect parts of the subject and to follow their own bent.

A choice of subjects within such an examination as the School Certificate Examination serves the same purpose as a choice of questions within a subject. It gives schools or candidates freedom to follow different courses within a given general scheme, such as the 'group system'. We should note that changing the choice of questions in an examination is one of the means available for varying its character and thus the character of the courses leading up to it.

Freedom of choice is not granted without a corresponding loss in definition of standard. For example, there are great difficulties in comparing the standard of work in the alternative School Certificate subjects, Botany and Biology, which are taken by distinct groups of candidates. In the School Certificate Examination, any school is allowed to substitute its own syllabus for the standard syllabus in a subject. Few schools avail themselves of the privilege, and these seldom have a special paper in more than one subject. In such a case, the examination in that subject at that school may be described as an internal section within an external examination. Provided the internal section is small compared with the portion taken in common with other schools, the difficulty of settling a standard may be unimportant.

The following table distinguishes various gradations between

the completely internal and the completely external examination paper. The classification is based on the externalness of the examination, taking into account the choice of questions allowed:

	Candidates	Choice of questions	Definiteness of syllabus	Question paper set by
1.	Pupils of a single class	None	Work covered by the teacher	Candidates' own teacher
2.	Pupils of a single class	None	Work covered by the teacher	Outside examiner in consultation with the class teacher
3.	Pupils of a single class	Fair choice	Syllabus stated in writing in some detail	Outside examiner
4.	Pupils of a single class	Large choice	Syllabus not clearly defined	Outside examiner
5.	Pupils from several schools or classes	Large choice	Syllabus not clearly defined	Outside examiners
6.	Pupils from several schools or classes	Fair choice	Syllabus stated in writing in some detail	Outside examiners
7.	Pupils from several schools or classes	Fair choice	Syllabus stated in writing in some detail	Outside examiners in consultation with representative teachers
8.	Pupils from several schools or classes	None	Syllabus defined by custom	Outside examiners

The first four examinations are internal; the last four external.

We can recognise one or two existing examinations in the series 1-8 in the foregoing table. For example, No. 7 corresponds to any single subject in the present School Certificate Examinations, which are developing in the direction of greater collaboration with teachers in setting questions, a fair choice

of questions, and syllabuses stated with as little ambiguity as possible. No. 6 may be said to summarise old-fashioned external school examinations. No. 8 represents some 'professional' examinations, such as 'medical finals', in which the examination is intended to ensure that the whole range of work is known, and the question papers are designed as much to find out what a candidate does not know as what he knows. Examinations 3 and 4 in the table correspond to examinations in different subjects in the colonial school examination described on p. 53. No. 3 also corresponds to the 'school' examinations described in Chapter IV (p. 75).

In order to understand the differences between the four internal examinations in the table, we have to consider how the examiners (i.e. those who set the papers) are related to the candidates and teachers (see Column 4). An outside examiner may set questions and use expressions different in kind from those used in the school. In the course of time, this has the effect of making both teachers and students modify their outlook on the subject, provided the teacher is prepared to recognise an outside body or examiner as a more enlightened authority than himself. The competent teacher is apt, however, to assume that his own approach to a subject is at least as satisfactory as that of the examiner, and so to consider an examination conducted by an entirely outside body of examiners a cramping influence on the work. In fact, the more competent and experienced the teachers, the less are they prepared to welcome outside authority exerted through an examination which their pupils are compelled to take. We find, therefore, that internal examinations conducted by an outside body have played an important part in backward schools, but that, as the standard of the schools has improved, this form of examination has tended to disappear and be replaced by external examinations in which the teachers have an increasing share of control, and adapted, by the use of alternative questions and subjects, to allow such freedom for individual methods as is desirable and necessary. The cramping effect of external examinations on teaching, which has received much attention lately, is traceable

not to the fact that the students from several schools take the same examination papers, but to the questions and tests being set by an outside body insufficiently in touch with the teachers.

We can summarise our conclusions on the influence of internal and external examinations on teachers and students as follows:

(A) An internal examination conducted by, or in close consultation with, the students' own teacher is satisfactory as an aid to teaching, but it exerts little influence on the teacher. Its influence on the students is slight unless there is direct competition between the members of the class for important rewards. A pass standard has little meaning.

(B) Internal examinations conducted by an outside body have been found useful in the past in backward schools, where they may exert a useful influence on the teachers. Apart from this, they are in every way less satisfactory than (A). They have to be based either on a detailed syllabus, which is in the hands of the teacher and the examiner, or on information supplied by the teacher as to the ground that has been covered.

(C) An external examination conducted by an outside body stimulates the students, because any pass standard expresses the result of competition with other students taught under different conditions, and thus appears to the students to have a certain absolute quality. Such an examination stimulates the teachers, because it places them in competition with one another. This stimulating action depends, of course, on the existence of a suitable reward for successful students. But, however carefully the syllabus is set out in detail, this kind of examination is apt to exert a cramping effect on the teaching.

(D) An external examination set and marked by representatives of the teachers preparing students for it, has all the advantages of (C) and can avoid the cramping effects, provided there is sufficient agreement between the teachers about syllabuses and methods of treatment. If this condition is satisfied, the individual teacher is prepared to accept question papers representing the collective wisdom of his colleagues. The condition is satisfied when (1) there is a certain co-ordination.

of syllabus and teaching methods in different schools,' (2) this co-ordination is achieved by democratic methods including the active participation of the individual teachers.,

EXAMINATIONS AND SCHOOLS. We have seen that an external examination taken by students from various classes brings the teachers of those classes into competition with one another through the students. What inducement causes the teacher to enter into such competition? Speaking generally, we can say that his reputation as a successful teacher is at stake. When teachers apply for their *first* appointment in a school, they compete with one another on the basis of their academic qualifications, and the record they bring with them from their training. On the other hand, *experienced* teachers applying for a post, are judged also on their record as teachers,¹ and one of the few methods available for measuring success in teaching is a knowledge of the number of students trained by the teacher who have passed the examinations for which they were preparing.

We have now to consider why schools, as distinct from the teachers in them, take external examination results seriously. Two separate cases must be distinguished, namely, the independent school and the school which is maintained and controlled by a Local Education Authority. The independent school is, by its nature, in economic competition with other schools. Parents who send their children to independent schools, and therefore pay for the whole cost of their education, naturally wish to obtain the best value for their money. If we leave out of account the desire for their children to acquire certain social habits which induces some parents to pay high

¹ The following sentence from an article by a secondary school headmaster in *The Times Educational Supplement*, on October 17, 1942, calls attention to the inadequacy of paper qualifications alone as a measure of ability: 'I have known teachers with diplomas or certificates in education, good discipline, energetic personalities, who, after 20 years' experience, had not even begun dimly to understand the difference between teaching and talking.'

fees at public schools, we can say that the value for which the parent is looking is the attainment of certain skills; and an important indication whether a school is fulfilling this requirement is provided by the performance of its students in an external examination. Thus external examinations place *schools* as well as teachers in competition with one another.¹ If a parent is not satisfied with the education which his child is receiving, he can remove him from the school and send him to another with a better examination record. The fear of losing pupils is the main force which leads independent schools to take external examination results seriously.

The maintained school is not in economic competition with other schools in the above sense. The dissatisfied parent seldom has an opportunity of sending his child to another maintained school. Why then should maintained schools be greatly concerned with external examination results? The answer to this question lies in the measure of control over the school possessed

¹ An interesting sidelight on our definition of an external examination as one which brings the pupils of one school into direct competition with those from another, is to be found in many towns where there are independent schools competing with maintained schools. The independent school often avoids being thrown into competition with the maintained secondary school by entering its pupils for the school certificate of a different examining body. In this way, the direct comparison between the two schools in the published lists of successful candidates is avoided. To say this is not to say anything about the relative standard of difficulty of the two examinations. Although the examination taken by an independent school may be more difficult than that taken by the secondary school (that is, if fewer boys pass than would pass if the latter examination were taken), it may pay the independent school to take the more difficult examination. Suppose each school presents 50 boys for the same examination, and the independent school has 30 passes, while the secondary school has 45; then the direct comparison is to the disadvantage of the independent school. Now suppose the independent school changes to another examining body and gets only 25 passes out of 50 candidates; there will no longer be a direct comparison. The results appear in different lists, compiled according to a different plan. It may even be possible for the independent school to let it be thought that a difference in the nature of the two examinations accounts for the difference in the percentage of successful students.

by parents through the machinery of local government. Although these parents have little or no freedom of choice, they have, by the working of democracy, a measure of control over the school. No headmaster of a maintained school underestimates the power of publicity and pressure exerted through members of the Education Committee. We have here an example of a principle that applies in many fields, namely, that, when a monopoly takes the place of free competition, there must, for the sake of efficiency, be some form of democratic control over the monopoly.

An external examination affects the work in a school according to the number of pupils taking it. For example, the Higher School Certificate and Oxford and Cambridge College Open Scholarship Examinations are both taken by members of the sixth forms of many schools. But the Higher School Certificate is taken by the whole form in most schools, whereas the Open Scholarship Examinations are usually taken by only a few boys. When the proportion of pupils in the form taking the scholarship examination averages only one candidate every two or three years, the effect of the examination on the Sixth Form work may be disregarded, and we can say that the work is governed by the Higher School Certificate. But, when, as in some of the larger schools, at least half a dozen students enter regularly, we find that the Open Scholarship Examinations have a definite modifying effect on the work of the whole form. Throughout the year, the teacher has to bear in mind the fact that a few of his pupils will follow up their Higher School Certificate work by entering for the Open Scholarship Examinations. Unless the syllabuses of the two examinations are entirely similar, the scholarship examinations have to share with the Higher School Certificate Examination responsibility for the work of the whole class. The multiplication of external examinations taken by pupils of the same class, with the consequent disorganisation of the work, has been a problem in secondary schools for the last fifty years. It has now been largely solved at the School Certificate stage, but is coming to the fore again at the Sixth Form stage.

Continuity of Training. The examinations with which we are concerned in this book can only be fully understood by taking into account their two aspects: (1) their stimulating effects on students and teachers; (2) their capacity for testing and selecting students. For example, Medical Finals provide both a goal for the medical student, and a safeguard for the public against inadequately trained doctors. The music examinations of the Associated Board of the Royal Schools of Music encourage boys and girls to study music, but they also provide a classification of students according to their musical attainments. The School Certificate is both a stimulus to school children and their teachers, and a means of deciding which pupils are fit to proceed to various kinds of employment.

Some people see examinations only as instruments for the selecting of students, and lose sight of their mobilising power in education. We have already traced one reason for this, namely, the rapid development of psychological testing. But the phenomenon also has deep roots in the present economic organisation of society which leads to an unnatural restriction of output. We have become accustomed to a state of affairs in which there are always too many people to fill a limited number of posts. This has not always been so. In the latter half of the nineteenth century there were unlimited fields of employment for those with higher education. It was during this period that our present examinations established themselves—not so much to hold back the unsuitable (although this was necessary), as to encourage and stimulate educational effort and enterprise, and so to increase the supply of skilled workers in all fields. When the present temporary period of stagnation and frustration has passed; when we have eliminated those features of our civilisation that are restricting activity and enterprise instead of calling them forth, we shall see examinations in a truer perspective.

An examination is a link between two phases in the education of the students taking it. We have to consider how it is connected both to the previous course of training and to the future activity of the students. In the first place, what have the

examination results to tell us about the students' past? They measure the success of the sustained course of training which has culminated in the examination. As the teacher and the students both contribute to this, the examination result for any student measures jointly that student's success in carrying through a course of activity, and the teacher's success in arranging and supervising the course. This definition of the meaning of the examination result is very different from many current ideas borrowed from psychological testing. Since the course of training and the examination are inseparably connected, a regularly established examination cannot measure innate characteristics of the students which are independent of the course of preparation.¹

Is there any corresponding relationship between the examination result and the probable success of the student in his future work? Yes, there is often such a connection, but it is not inherent in the examination itself. Such a connection depends on the *planned* relationship between the examination, and hence the course of preparation for it, and the future activities of the students. From the educational point of view, we want to achieve a connected course of training in which each stage leads on to the next. The importance of the examination in this sequence arises from its power to control the character of the previous phase of training, and to select students on the basis of that training. When we say that an examination should be related to the future needs of the students, we are merely

¹ The technical term *validity* is often used to express the effectiveness with which an examination or test measures that which it is intended to measure, or the effectiveness with which it accomplishes the purpose it is intended to accomplish. The first part of this definition, which is taken from *The Construction and Use of Achievement Examinations*, p. 21 (see footnote, p. 49), is so worded as to apply only to examinations as instruments of measurement. When we accept the fact that an examination conditions the course of preparation for it, we have to identify its *purpose* with that of the course of training. The term *validity* is so restricted in its current use by the idea of measurement, that it seems to have little value as an index of the suitability of a test whose purpose includes that of directing a course of training.

saying that their *training* should be related to their future needs.

The following sequence of phases—(1) Advanced Course at a Secondary School; (2) University Honours Course; (3) After Career—furnishes us with an example of three periods in the life of a student which are linked by two examinations, namely, the Higher School Certificate, and (at Cambridge) the Tripos. The Higher School Certificate is the culmination of a two years' advanced course, and also the method of selecting students for scholarships to the university. The result of this examination cannot claim to give an infallible forecast of the way in which the successful student will tackle his university course, because this will depend upon numerous factors, many of them outside the province of this book. It can only inform the university authorities that the student has completed his previous two years' course with success, and has thus become possessed of certain knowledge and practised in certain methods of thought. Similarly, the university Honours examination classifies students on the basis of their three years' activity at the university, and passes them out into the world to take up various kinds of work. The fact that a student has obtained first-class honours in Natural Sciences at Cambridge is not a guarantee that he will become a good research chemist, a good schoolmaster, or a good administrator. Many of the qualities required for success in these fields are unrelated to the qualities required for successfully carrying through an honours course in science; much of the knowledge gained may even be useless afterwards. All that can be said—and it is a good deal—is that, because the student has been able to apply himself successfully to one course of action, there is reason to suppose that he will be able to apply himself successfully to another.

Considerations of this kind re-emphasise the importance of the character of an examination in relation to the subsequent activity of those taking it. For example, at Cambridge University the Tripos examinations represent the main force controlling the direction in which energy is expended by students and dons. The character of the Tripos questions is

therefore vitally important to the whole university work. Suppose, for example, that the Natural Sciences Tripos examiners gave highest marks to those students who were able to learn the greatest number of relevant facts. This emphasis on facts would show itself within a few years in two ways. The students obtaining first-class honours would be those who had shown greatest proficiency in memorising facts; they would thus tend to do well later in work requiring this facility. Secondly, the students would tend, during their three years' course, to exercise their minds in the memorising of facts, and, whatever the lecturers might say, memorising facts would become the main feature of a Cambridge honours course in Science. Fortunately, the Cambridge Tripos examiners do not give greatest weight in the examinations to this element of learning, but rather to other elements, on the basis of which the reputation of the Cambridge Honours degree has been built.

CONTROL OF EXAMINATIONS. The character of an examination depends upon those administering it, for they draw up the regulations; they decide who shall draft syllabuses and set and mark the papers; and they decide what weight shall be given to various factors in assessing the final result. In the last resort, the control rests with some board or examining body, and the composition of the body is therefore important. Generally speaking, the examination should be run jointly by those responsible for training the students before the examination, and those responsible for their activities after they have taken it. Unless both groups are represented, it is difficult to secure continuity of training.

In Part II of this book we shall recommend that the drawing up of syllabuses shall be a separate responsibility from the conduct of the examinations. But the principle that control should be shared by those concerned with the students before and after they take the examination applies in both fields. If this principle were accepted in regard to syllabuses, we should hear less talk about 'over-specialisation'. Over-specialisation

arises from the control of syllabus—and, to some extent of question papers—being in the hands of too narrow a section of people. In the early stages of education, for example, at the School Certificate stage, future activities will be different for different pupils in the same class. In fact, the individual pupils have not yet reached the stage when their future activities are settled. At the Higher School Certificate stage, many of the students have already made up their minds what their future activity will be, and follow different courses accordingly. This explains why the one examination is more specialised than the other. In general, the content of each stage of the school, university, or technical college courses should be based on the least common denominator of the needs of the various students taking it. Unfortunately, many of the existing syllabuses carry much dead wood in the form of items that can be of little use afterwards to any of the students. These items should be pruned out by agreement between the teachers and representatives of those responsible for the pupils' future activities. We suffer, at present, from the absence of machinery for co-ordinating and planning syllabuses. The present lack of balance in secondary school education is traceable to the way in which various examination syllabuses are drawn up 'by the light of nature' by separate bodies without mutual consultation.

Some of my readers may feel that I am attempting to reduce education to items in syllabuses, on the one hand, and to the formation of habits, on the other. Such criticism would be justified if the items in the syllabus and the habits of thought and activity that result from their inclusion in the curriculum, were restricted to a narrow field. In fact, the development of such qualities as initiative, perseverance, and orderliness are encouraged or discouraged by various kinds of syllabus and examination test, and the problem facing examiners is to encourage the development of these qualities in due proportion. This can best be done if the examiners are in touch with the difficulties of the teacher, and with the needs of the students in after life.

The Higher School Certificate furnishes an example of an

examination which is controlled more by those concerned with post-activity than by the teachers. Each Higher School Certificate Examination is still largely controlled by the university or universities giving their names to it, although much has been done to draw the schools into co-operation. University examiners are able to emphasise in the papers those aspects of the work which they consider should be stressed by the teachers—that is, those aspects which are most likely to form a good basis for a subsequent university course. There are two reasons why this over-emphasised university control is unsatisfactory, even when shared with the teachers. First, the students taking any one Higher School Certificate Examination may go to different universities, so that the present lack of co-ordination between the various university requirements makes the planning of school work difficult. Secondly, a large proportion of successful students do not proceed to any university, and those responsible for their future activity should, therefore, have a share in drawing up the syllabuses or in running the examinations. If the syllabuses took into account the needs of *all* the students, and not merely those proceeding to the particular university or universities controlling the examination, we should have more satisfactory advanced courses in schools. We should also be able to develop an agreed and planned policy for these courses, which are at present subject to too many different and unco-ordinated influences.

The Cambridge Tripos, on the other hand, furnishes an example of an examination which is controlled almost entirely by those responsible for the three years' course leading up to it. Those who teach this year may be examining next year. Whatever disadvantages this system may have, it ensures that lectures, supervision classes, laboratory sessions, and examinations, are regarded by all as different parts of a common machinery of education. It breaks down in so far as the examiners fail to understand what qualities and knowledge will be most valuable to the students in their work after they leave the university.

We may note in passing that the Oxford and Cambridge Honours Examinations are internal examinations in that they do not bring the students into competition with those from other universities. Considered from the point of view of the separate colleges, they are external examinations, and the competition thus created between the college teachers has, in the past, been an important factor. During the last thirty years, however, especially in science, university teaching has gradually been taking the place of college teaching, and the element of competition between teachers has been reduced. This is reflected in the tendency, within the university, for students to be classified, even before they begin their course, as a 'first class man', or 'second class', so that the teacher is able to disclaim any responsibility for the final examination results. The interesting point, as regards our present argument, is that the examination by those responsible for the teaching leads to an excellent degree of co-ordination of purpose between teachers and examiners.

The question arises, ought not those concerned with the future employment of university students to have a share in the control of the university Honours Examinations, and hence of the honours courses? I think the answer is that they ought. In certain respects they already have such a share. Medical examinations, for example, are governed directly or indirectly by the medical profession, and we can assume that industry will concern itself in the future more, rather than less, with the content of university courses, technical and non-technical. Modern languages courses need to be linked to commercial requirements, and to the real needs of the diplomatic service. Just as the universities are gradually sharing their control of the Higher School Certificate Examinations with the schools, so they will come to share control of their own final examinations with those responsible for the future activities of successful students.

We will complete the present chapter by considering another set of examinations which link school with university, namely, the Cambridge College Open Scholarship Examinations.

These were (until 1943) held each December to select school-boys by open competition for the award of valuable entrance scholarships. They are run by the colleges, acting jointly in groups. The prevalent and quite natural attitude of the examiners is that the funds are held in trust by the colleges, whose sole duty is to see that scholarships are awarded to the most promising students irrespective of the schools they have attended. They would like to think that the examinations were independent of any course of preparation. My work has enabled me to compare the different ways in which school Sixth Form masters and college examiners approach these examinations. I was present a year or two before the war at discussions on the scholarship science papers at which the teachers pointed out that the examinations exerted a considerable influence on school teaching, and complained that some of the questions set led to undesirable 'specialisation' in the better-staffed schools. They stressed also that special teaching was only possible in the larger schools, a fact which made it difficult for boys from small schools to compete on equal terms. They asked for the limits of the syllabus to be defined, so that boys and teachers might know how much ground had to be covered.

The examiners replied that co-operation between examiners and teachers was unnecessary, and even undesirable, because the examination was not concerned in any way with teaching, but merely with the selection of the best boys. They were looking for 'promise', not knowledge. They said that to restrict the syllabus would make it difficult for the examiners to set questions which would come unseen to the students, pointing out that when questions were set on advanced topics, they were always framed in such a way that the best boys could answer them on the basis of principles included in more elementary syllabuses. They admitted, however, that they sometimes set questions in a certain form in the hope that they would lead teachers to adopt a certain mode of approach which they considered important.

Certain general considerations emerge from this conflict of

views.¹ The examiners set out to give the highest rewards to 'talent' and 'promise' rather than to learning. They ignored what appears to me to be a fundamental principle, that an examination tells us about a candidate's past, but not about his future. Its reliability as an indication of future success depends upon the extent to which a student's future activity will resemble his past activity. A similar principle appears to be employed with benefit in selecting generals for high command in war. Commanders who owe their position to an estimate of their 'promise' often have to give way in the long run to those who have proved their ability by their part in previous campaigns or battles of the same kind. Scholarship examiners are sometimes led to imagine that, if their examination questions bear little relationship to the work the students have been doing, they will be able to select the students possessing 'real' talent. My opinion is that this is a dangerous and unreliable method, which may often lead to the selection of quick-witted, glib, but not necessarily sound students. Teachers know that the Open Scholarship Examinations are a stimulus to the expenditure of much energy in some schools, and that this is an important factor in the award of the scholarships. If the examiners wish to be independent of the teachers, they should jealously guard every copy of the examination papers (as is done with group intelligence tests) instead of publishing them in pamphlet form after the examination.

In spite of their undoubted merits in enabling the examiners to interview the candidates during the examination and in securing direct open competition between first-class students who take different Higher School Certificate Examinations, it seems to me that the Open Scholarship Examinations have exercised a bad influence on education during the past thirty years. This is traceable to the fact that they are entirely in the hands of a body of people outside the schools. The teachers often find themselves compelled to teach what they consider

¹ The gap between examiners and teachers has been bridged to a great extent in the last few years, at least in science subjects.

to be unsuitable topics for the sake of an examination over which they have no control. In contrast, school teachers have the right, and the machinery, to influence the character of the Higher School Certificate Examinations. Fortunately, active steps are now being taken to bring the College Scholarship Examinations and the Higher School Certificate into closer touch.

CHAPTER IV

DEVELOPMENT OF EXAMINATIONS BEFORE 1911

IN mediaeval times education was controlled by the Church, which imparted to it a simple kind of order and plan. Particular schools and universities worked together as parts in a whole. The schools provided students for the university, and the university, teachers for the schools. There was little variety in this very limited educational system. The curriculum was laid down and quite definitely demarcated between school and university. But the Reformation, and, later, the Industrial Revolution, produced an influx of new schools and educational establishments of all kinds which upset this primitive order. During the nineteenth century there was an unparalleled growth of private, public, endowed, and church schools, universities, university colleges, and technical colleges, most of them catering for the rising middle classes. The schools obtained their pupils and their teachers where they could, and sent their scholars to the different universities or industries as they could. The old connections between school and university were no longer significant and education was carried on in a number of separate institutions, neither standardised nor controlled, and, in the main, unconnected with each other. At the close of the century, when the demand for middle-class schools was supplemented by a demand for secondary education for working-class boys and girls, county and municipal secondary schools, maintained and controlled by Local Education Authorities, came into existence. The present century has seen more and more control of this great variety of educational establishments, and the gradual emergence of a unified system.

It is important to keep in mind this trend from free competition to planning and democratic control as the background against which we have to view school examinations. For the purpose of our short survey, we will divide the history of examinations into two periods—that before and that after

1911, the year of the Consultative Committee's *Report on Examinations in Secondary Schools*.

The first period may be said to begin in 1858 with the appointment of the Civil Service Commission and the first appearance of the Cambridge Local and Oxford Local Examinations.

The Civil Service Examinations, instituted by the above Commission, so far as they affected what we now call 'Secondary Schools', do not appear to have played an important part in determining curriculum. Their importance lay in establishing the principle that civil service appointments should be by public competition and not by private patronage. Since they were not taken by many candidates from any one school, they were not effective in bringing the teachers in these schools into competition. Their main repercussion on education, to which attention was called in the 1911 *Report*, was the opening of special 'cramming establishments' which existed for the purpose of getting boys a high place in the examinations in exchange for high fees. Their influence on teaching was probably confined to these establishments which were related to the examination in somewhat the same way as First Aid classes are related to the First Aid examinations.

The three examinations which exerted the greatest influence on school curricula during the period 1858-1911 were the Cambridge Locals, the Oxford Locals, and the London Matriculation. The Cambridge and Oxford Local Examinations were a new venture launched by the two universities as a result of representations made to them by a body of people "interested in promoting a good general education as a preparation for scientific and commercial pursuits" . . . They were open to candidates of every social rank and every religious denomination. The candidates had to satisfy the examiners that they had mastered the elements of a plain English education, after which they were allowed a wide latitude in the selection of subjects.¹ As will be seen from the

¹ 1911 *Report of the Consultative Committee on Examinations in Secondary Schools*, pp. 12, 13.

following extract from the Regulations for the Cambridge Examinations for December, 1858, the examinations were organised through Local Committees in various centres. These Committees were self-appointed bodies of local persons of standing interested in education; they often included the principals of schools presenting candidates:

Local Committees, wishing to have examinations held in their several districts, may obtain all necessary information from the Vice-Chancellor of the University.

Applications on behalf of Students desiring to be examined at Cambridge must be made on or before November 1, 1858.

Applications from Local Committees for examinations to be held in their districts must be made on or before October 1, and the probable number of Students to be examined must be then stated. The names of such Students must be sent to the Vice-Chancellor on or before November 1, 1858, together with statements of the subjects in which they will offer themselves for examination.

The fees for all Students must be paid on or before November 1, 1858.

H. PHILPOTT, *Vice-Chancellor*.

CAMBRIDGE,
March 25, 1858.

The examinations were looked upon as an extension of the university into the outer world rather than as a part of the school education system. For the first three years, the class lists were headed, 'Examination of Students not members of the University'. The contract for the examination was made by the individual student and his parent directly with the university. The school took no part in it, and the examinations were held, as often as not, in a public hall. On the first day, the Presiding Examiner, complete with cap, gown and hood, came direct from Cambridge with the question papers and took complete charge. For a week the university extended its premises to include these examination halls in different parts of the country.

Although the Local Examinations were essentially concerned with candidates as individuals, nevertheless, they were often held in school buildings and it was not unusual for a single

school to provide the bulk of the candidates in any one town, or even to send in whole classes. In such cases the examinations took on the character of school examinations as well as public examinations. This examination of a school by an external body was found to be so useful that a parallel system of '*School Examinations*' was instituted by the Cambridge Local Examinations Syndicate and the Oxford Delegacy. These were internal examinations in the sense in which we have used that term, because they were specially arranged for each school. They were often accompanied by a visit from an Inspector appointed by the university, and were managed in the following manner. The school prepared and sent to Cambridge schedules of the courses of study followed by each class in each subject. The Syndicate then appointed examiners who were able between them to set papers for all forms in all subjects, based on the schedules of study prepared by the school staff. These question papers were sent to the school and set to the pupils by the school staff who were responsible for marking the answers. The marked answers were sent to the examiners, who modified the marks where necessary and returned them to the school. The examiners also prepared a report on the work in each subject in each form, and these reports were collated, edited, and copied in Cambridge and submitted officially, sometimes to the Principal of the school and sometimes to the Governors, with an account for the cost of the examinations. An inspection of the school premises often took place at the same time as the 'School Examination', and the Inspector's report was incorporated with that of the examiners. In some cases, the upper classes took the Local Examinations, and the lower classes a 'School Examination', special reports on the work of candidates in the Local Examinations being incorporated with the report on the 'School Examination'. These 'School Examinations' sometimes included *viva voce* tests, especially of the younger children, and so took on the character of inspections. Organisationally, the 'Local' examinations and 'School' examinations were kept separate. Remnants of the 'School' examinations still remain in the filing system at Syndicate

Buildings, Cambridge, under the heading 'Schools', or 'Non-Locals'.

The Oxford Local Examinations were instituted in the same year as the Cambridge examinations, only six months earlier, and were conducted on entirely parallel lines, often by the same Local Committees. The London Matriculation Examination, however, was intended to serve a quite different purpose from the Local Examinations instituted by Oxford and Cambridge Universities. These two universities admitted (and still admit) no students to degree courses unless they came into residence in the university. The 'Previous Examination' (Little Go), which was the stepping-stone to matriculation¹ at Cambridge, could (and still can) only be taken by those who had made arrangements to come into residence. The London Matriculation Examination, like the London external degree, was (and still is) open to all. The original incentive to pass the 'Locals' was the desire to possess a certificate granted by one of the ancient universities,² whereas the original incentive to pass the London Matriculation Examination was the desire to enter on a course of study for a degree. The following is an extract from the evidence given before the Consultative Committee in 1910 about the London Matriculation Examination:

...the syllabus was laid down by the University. It was simply an examination for entering into the University, and had no relation to any particular schools. It gradually, however, began to be used as a kind of popular Leaving Examination for Secondary Schools; it

¹ The word matriculation merely denotes the act of admission to a university confirmed by the payment of a fee.

² The importance attached to these examinations is shown by the lists of nearly a thousand names attached to a memorial to the University of Cambridge in 1863, which began, 'As being officially engaged in or connected with female education, we beg respectfully to call your attention to the existing want of some publicly recognised examination for girls. We believe that this want could in no way be better supplied than by the extension to girls of the University Local Examinations.' The Memorial was supported, among others, by Mrs Gaskell, Mrs W. E. Gladstone, Mrs Charles Kingsley and Thomas Huxley.

came to be an end in itself, success in which was regarded as certifying to a good school education. It had no relation, however, to the course of study through which a pupil had passed, or to the school from which he had come. It grew up side by side with the Oxford and Cambridge Locals, being popularly regarded, however, as more difficult than the Oxford and Cambridge Senior Locals. There was certainly truth in this view, for, among other reasons, the Oxford and Cambridge Locals allowed a very large choice of subjects, which the London Matriculation did not, and this in itself made the latter examination harder [at p. 383].

These three examinations, the Oxford and Cambridge Locals and the London Matriculation, were all conceived as examinations of individual candidates. The certificates soon took on a considerable value as a gateway to appointments or to further education. The fact that one of the examinations was the first step in a degree course, while the others were not, was not important when the certificates were sought after mainly as a means of entering into business or the professions by students who had no intention of going to a university.

Having looked at the form in which examinations first made their appearance, we can now trace the emergence of new examinations, and mark the extent to which they incorporated new principles and the extent to which they followed the pattern already laid down.¹

The Oxford and Cambridge School Examinations Board (popularly called the 'Joint Board') was founded in 1874 with the object of providing an examination suitable for the Sixth Forms of those schools which sent a large number of their boys to the two universities. It introduced two new principles.

¹ We have omitted all mention of the examinations of the College of Preceptors, not because they were unimportant, but because the course of history was such that they did not develop. They were instituted several years before the 'Locals', and it seems reasonable to suppose that the founders of the latter took many of their ideas from them. They were run on much the same lines as the 'Locals', by which they were gradually ousted owing to their failure to receive Government recognition.

First, the principle that the examination, though external, was a school examination as opposed to an examination for individual candidates. Thus, entry for the examination was made by the school on behalf of a class of boys, and not, as in the examinations already mentioned, by the individual boy; but, unlike the 'school examinations' so far discussed, the same examination was taken by different schools. Secondly, the new principle that the examination was designed to form a link between the school and the universities to which the boys were soon to proceed. The examination was a means of enabling the public schools to have the benefit of the ideas and advice of the university teachers who were soon to take charge of their pupils, and it provided machinery for the universities to influence the pre-university education of undergraduates.

This examination followed the pattern of the times in being run entirely by the universities, the school teachers having no hand in it. It was the first conscious attempt to use an external examination to link and co-ordinate the work of a number of different schools, and also to form a connection between those schools and the future activity of a high proportion of their pupils. The fact that this examination¹ was thus one of the means of consolidating the public school system and isolating it from the rest of the educational system, should not blind us to the fact that it achieved what it set out to do. This Board has proved beyond doubt what an external examination can achieve in co-ordinating school activities and leading them in a certain direction.

A new development of school examinations followed the institution in 1902 of the (London) University Extension

¹ In this account we have ignored for simplicity's sake, the fact that the three Oxford and Cambridge examining bodies each conducted examinations of different standards, namely, the Senior, Junior, and Preliminary 'Locals', as well as Higher Locals; and the Joint Board soon followed up its Higher Certificate Examination with a Lower Certificate, and finally with a School Certificate. On the whole, these different grades of examination followed the same plan as the first examination instituted by each particular body.

Board, which was entrusted with the examination and inspection of secondary schools. This was an attempt on the part of London University to modify its relationship with schools in the direction indicated by the activities of Oxford and Cambridge. At that time there was much criticism of the influence which London Matriculation was having on those schools which made it their main external examination. In order to understand the direction of this new development, we must remember that the bodies responsible for the 'Locals', and also the Joint Board, conducted a considerable number of internal 'school' examinations and inspections in addition to their certificate examinations. In these internal examinations the teachers played a large part. Inspection was brought to the fore at that time by the Education Act of 1902, which marked the beginning of State Secondary School Education. The three universities were anxious to maintain their more intimate connection with certain schools, which had arisen in the case of Oxford and Cambridge as much through internal examinations and inspections as through the Certificate Examinations. This was the background against which these new developments were planned by London University. The witnesses before the Consultative Committee in 1910 are quoted as follows:

...the [University Extension] Board decided that there was no reason for starting another Local Examination in competition with the Oxford and Cambridge Examinations on exactly the same lines. Indeed, the existing Matriculation Examination was doing all that need be done as far as the University of London was concerned. Therefore, it was felt that if they had to start a new examination at all, it ought to embody some new principle, and, in particular, an intimate association between inspection and examination. They drew up a scheme, therefore, on these lines. That was in 1902. In that year the scheme for the inspection of Secondary Schools and for the School Leaving Certificate (Matriculation Standard) was passed by the Senate....[This] was founded on the following principles: first, that...it should only be held in a school under inspection by the University or some body approved by them; and, second, that no candidate should be eligible for a certificate who had not been for two years under instruction in an inspected school. The combination of necessary subjects in the examination was the same as in the

General Matriculation Examination. Successful candidates on leaving school obtained the School Leaving Certificate, and this qualified them for admission to the University without further examination. The examination was intended for pupils over 16 years of age. But a Regulation was passed in 1906 permitting schools to enter pupils between the ages of 15 and 16 for this examination, provided it was taken as a Form Examination and that the proportion of pupils under 16 years of age was not unduly large. The Certificate, however, was in no case awarded until the candidate attained the age of 16 [at p. 383].

Like the Joint Board, London introduced the principle that a school could, on payment of an extra fee, substitute its own syllabus for the published syllabus in any subject, the children at the school being given a special alternative paper in this subject. When the Oxford and Cambridge Joint Board instituted their School Certificate Examination in 1905, they extended a principle, initiated by London, and restricted the certificate to pupils who had attended for three years at a school which was inspected and approved by the Joint Board itself or by the Board of Education.

We are now approaching the end of the first period, and it is only necessary to notice the setting up in 1903 of an institution which was destined later to play a most important part in the development of school examinations. This was the Northern Universities Joint Matriculation Board. The Board, at that time, was confined to the four universities of Manchester, Liverpool, Leeds and Sheffield; it was brought into being for the purpose of conducting a common matriculation examination for its constituent universities. This matriculation examination came to play a similar part in the schools taking it to London Matriculation, in that it was taken by many candidates who had no intention of proceeding to a university. It was also utilised by Local Education Authorities as a means of awarding scholarships. In 1910, the Northern Board followed the example set by London University in 1902, but the changes which it introduced were more realistically planned with a view to their effect on school education. Perhaps this

was due to the great advantage which the Board possessed in having among its twenty-two members two headmasters and two headmistresses.¹

The changes, which had been on trial for only one year when the Report was written in 1911, included (1) the restriction of the matriculation examination to individual students wishing to enter one of the universities; (2) the institution of a Senior School Certificate Examination, which, like the London Senior School Examination, was a more flexible examination than matriculation, and yet could be used for purposes of exemption from matriculation; (3) the adoption of the principle that 'it should be the rule and not the exception for the teaching staff to take part in the examinations'; (4) the institution of a system of inspection of schools.

Thus ends the first period, 1858-1911. It was a period of *laissez-faire* in school examinations, and, looking back, we can observe trends in their development before the first measures of government control were introduced. Two distinct forms of examination made their appearance at a very early stage—the external certificate examinations and the internal 'school' examinations conducted through the agency of an outside examining body. As both the standard of efficiency of the schools and the salaries of the teachers improved, the internal

¹ Giving evidence in 1910, the Chairman of the Board said that 'the presence of the teachers on the Board had been invaluable, both in giving their personal experience as to what was needed, in suggesting names of persons who could help in the examining work, and guarding the Board against the danger of relying too much on the advice of persons whose main or only experience had been in University work' (1911 *Report*, p. 394).

In my opinion, the striking success which the school examinations of this Board achieved in the thirty years following their inception, is traceable, to a considerable degree, to the presence on it of teachers actually working in the schools taking the examinations. It is noticeable that—to take an example—the Cambridge Syndicate denied itself this advantage until 1932, when it began to profit markedly from the inclusion among its membership of the principals of three schools and one Director of Education.

examinations failed to develop to the same extent as the external examinations. The success of the original examinations bore witness to the way in which the schools turned to the universities for guidance and assistance in establishing standards of 'general education', but it is interesting to note that each new external examination gave increased recognition to the principle of co-operation between the school and the university. Everyone concerned became increasingly aware of the need for more direct contact between the schools and the examining bodies than was provided by the certificate examinations. The internal 'school' examinations and inspections appeared to provide the examining bodies with a basis for helping individual schools with their particular problems. How to combine the merits of the two systems was clearly one of the questions exercising the minds of those devising the new external examinations.

THE 1911 REPORT OF THE CONSULTATIVE
COMMITTEE ON EXAMINATIONS IN
SECONDARY SCHOOLS

This *Report* includes exhaustive accounts of the historical roots and the ramifications and interconnections of the various examinations existing in 1910. It indicates the advantages and disadvantages of examinations as the Committee found them, and draws conclusions about the principles which should govern their future development and control. It is an interesting fact that the examinations which were instituted as a result of this *Report* embodied few, if any, features not already found in one or more of the examinations described in the *Report*. This should not be taken in itself as a criticism of the *Report*. Successful reform, however revolutionary, will be found to proceed by developing features which have already made at least a rudimentary appearance. The peculiar genius of the reformer is revealed, not in devising utopian systems in the seclusion of his study, or even at the committee table, but in visualising the general movement of social development; in encouraging those

institutions and new tendencies, however slender, which will help this general forward movement; and in restricting those institutions or tendencies, however powerful, which are hindering the forward movement. This principle appears to have been recognised by the Committee. Their failure appears to have been in the analysis of the principles underlying examinations themselves. They failed to enunciate these principles sufficiently clearly to prevent the Board of Education from launching the School Certificate Examination seven years later in an atmosphere of confusion.

The actual proposals of the Committee (Chapter v of the *Report*) were vague and timid compared with their lengthy deductions about 'The Better Regulation of External Examinations' (Chapter iv). This also seems to be due to their failure fully to master what may be described as the theory of the examinations which they were discussing. It may well be, however, that a further period of development was necessary before reforms were possible which could set the examination system on its feet. It is easy for us to judge the problems facing the Committee in 1911 in the light of the developments which followed the reforms of 1917.

The following is a quotation from the beginning of Chapter iv of the *Report*:

... it will be convenient if we summarise what we believe to be the more important effects of examinations (1) on the pupil, (2) on the teacher.

(1) The good effects of examinations on the pupil are (a) that they make him work up to time by requiring him to reach a stated degree of knowledge by a fixed date; (b) that they incite him to get his knowledge into reproducible form and to lessen the risk of vagueness; (c) that they make him work at parts of a study which, though important, may be uninteresting or repugnant to him personally; (d) that they train the power of getting up a subject for a definite purpose, even though it may not appear necessary to remember it afterwards—a training which is useful for parts of the professional duty of the lawyer, the administrator, the journalist, and the man of business; (e) that in some cases they encourage a certain steadiness of work over a long period of time; and (f) that they enable the pupil to measure his real attainment (i) by the standard required by outside

examiners, (ii) by comparison with the attainments of his fellow pupils, and (iii) by comparison with the attainments of his contemporaries in other schools.

On the other hand, examinations may have a bad effect upon the pupil's mind (*a*) by setting a premium on the power of merely reproducing other people's ideas and other people's methods of presentment, thus diverting energy from the creative process; (*b*) by rewarding evanescent forms of knowledge; (*c*) by favouring a somewhat passive type of mind; (*d*) by giving an undue advantage to those who, in answering questions on paper, can cleverly make the best use of, perhaps, slender attainments; (*e*) by inducing the pupil, in his preparation for an examination, to aim rather at absorbing information imparted to him by the teacher than at forming an independent judgment upon the subjects in which he receives instruction; and (*f*) by stimulating the competitive (and, at its worst, a mercenary) spirit in the acquisition of knowledge.

(2) The good effects of well-conducted examinations upon the teacher are (*a*) that they induce him to treat his subject thoroughly; (*b*) that they make him so arrange his lessons as to cover with intellectual thoroughness a prescribed course of study within appointed limits of time; (*c*) that they impel him to pay attention not only to his best pupils, but also to the backward and the slower amongst those who are being prepared for the examination; and (*d*) that they make him acquainted with the standard which other teachers and their pupils are able to reach in the same subject in other places of education. On the other hand, the effects of examinations on the teacher are bad (*a*) in so far as they constrain him to watch the examiner's foibles and to note his idiosyncrasies (or the tradition of the examination) in order that he may arm his pupils with the kind of knowledge required for dealing successfully with the questions that will probably be put to them; (*b*) in so far as they limit the freedom of the teacher in choosing the way in which he shall treat his subject; (*c*) in so far as they encourage him to take upon himself work which had better be left to the largely unaided efforts of his pupils, causing him to impart information to them in too digested a form or to select for them groups of facts or aspects of the subject which each pupil should properly be left to collect or envisage for himself; (*d*) in so far as they predispose the teacher to overvalue among his pupils that type of mental development which secures success in examinations; (*e*) in so far as they make it the teacher's interest to excel in the purely examinable side of his professional work and divert his attention from those parts of education which cannot be tested by the process of examination.

It will be seen that the dangers of examinations, and especially of external examinations, are considerable in their possible effects both on pupil and on teacher. We have no hesitation, however, in stating our conviction that external examinations are not only necessary but desirable in Secondary Schools. But we are equally convinced that if the admitted advantages of external examinations are to be secured and the dangers of them minimised, such examinations should be subjected to most stringent regulations as to their number, the age at which they are taken, and their general character.

The fundamental principles which we think must underlie any improved system are as follows:

(i) Examinations which are conducted by external examining bodies and of which the primary object is an educational one, should be brought into intimate connection with inspection, the existing system of inspection being modified and developed so as to meet the new needs.

(ii) The existing multiplicity of external examinations (including those of Universities, and professional and other bodies), the claims of which at present so frequently interfere with the best work of the schools, should be reduced by concerted action.

(iii) All external examinations should be so conducted as to assist and emphasise the principle that every Secondary School should provide, for pupils up to an average age of 16, a sound basis of liberal education, which, though not necessarily of the same type in all schools, would serve as a foundation upon which varieties of further education could be based [at pp. 102-104].

The first part of this passage and the last two fundamental principles give an admirable account of some of the functions of examinations and some of the problems connected with them, and deserve attention to-day. But the first fundamental principle, namely, the need for an intimate connection between external examinations and inspection, failed to lay bare the realities of the situation. It seems probable that the Committee was feeling its way towards a closer association of the school and the examining body conducting external examinations. If it had formulated the problem in this way, the Committee might have succeeded in proposing a plan which would have led to its solution. The other two principles have since been realised in large measure, but the unity of

inspection and examination is no more a reality to-day than it was in 1911.¹

The situation referred to in principle (ii) was as follows. During the previous fifty years a plethora of different examinations had arisen; each was designed to be the gateway to one particular university or profession; each had its own list of compulsory subjects and its own peculiarities of syllabus. For example, there were seven different professional examinations concerned with 'general education', in addition to about the same number of matriculation examinations; and there were probably the same number of professional bodies who, while not conducting their own examinations, required certain specified subjects to be taken in other examinations. The schools found themselves faced with an impossible task in preparing for all these examinations which obstructed the evolution of a uniform secondary school course. The upper

¹ 1911 *Report*, p. 136: 'The evidence given to us by Dr Keynes, formerly Secretary of the Cambridge Syndicate for Local Examinations, justifies the hope that it may be possible to find, by mutual consent, methods of closer co-operation between inspectors and examiners. He said that "the best arrangement seemed to be for the Universities to examine and for the Board of Education to inspect; but, if that were done, there should be close co-operation between the two. It was essential, for instance, that the inspectors should know exactly what examinations were being taken in the school and should acquaint themselves with the character and working of such examinations. They might then do a great deal to ensure that the schools made the best use of the examinations. They should also have access to all reports issued by the Universities. The Syndicate's detailed reports gave a good deal of information about the work of each candidate in the Local Examinations in each subject of examination, and these reports should be open to the inspectors to see. Without such information an inspector might easily be misled as to the value of the work which a school was doing. On their side, the Syndicate would be glad to receive suggestions from the inspectors and to enter into co-operation with them." We believe that if a conference were held between the Board of Education and the existing examining bodies it would be found possible, by mutual consent, to take the first steps towards such a settlement as our inquiry had led us to commend.'

forms had to be divided into sections working for different examinations. It is true that the main 'educational' examinations and the matriculation examinations were accepted, under widely varying conditions, as exempting from other examinations; but the particular conditions required for exemption varied so much as to cause considerable disorganisation in the schools. A further problem was presented by the Junior Examinations of the various examining bodies. These were taken a year before the main examinations, with the result that the children were overwhelmed by having to take one examination after another.

Principle (iii) is worth particular attention because it recognises the principle, which has never been whole-heartedly accepted since, that examinations should be utilised as a means of planning and guiding the curriculum. It gave rise to the group system in the School Certificate Examination, but was then lost sight of in the confusion created by the Board of Education's 'Cardinal Principle' (see pp. 97, 98), that the examinations should follow the curriculum and not control it.

The failure of the Consultative Committee to reach a proper understanding of examinations is brought out by the following definition of the term 'external examination', which occurs as a footnote to p. 102 of their Report:

The term 'external examinations' is perhaps somewhat ambiguous. We think our meaning will be clear if we state that unless the context requires a wider interpretation of the expression, we use it in reference to examinations such as the 'Locals' which, though used for other purposes, are primarily educational in their aim.

When the Committee classified examinations as those which are primarily 'educational' in their aim, and those which are not, it placed in the first category the two 'Local Examinations', the Oxford and Cambridge Joint Board Examination, the London Senior School Examination, and the new Northern Universities Senior School Certificate Examination. The examinations which were not considered to have a primarily educational aim were the various Matriculation Examinations, the Civil Service Examinations, Army and Navy Entrance

Examinations, and the Preliminary Examinations of various professional bodies. It seems to me that the attempt to distinguish examinations as 'educational' or 'not educational' was unfortunate, and failed to lay bare the real differences between the two kinds of examinations. Examinations in the first category were designed with an eye mainly on their influence on the course of training of the candidates preparing for them; those in the second category were concerned with the future activities of those who passed them. The first, in the phraseology of previous chapters of this book, were intended to stimulate the students to activity; the second to select them as a result of their activity. Each, in fact, fulfilled both functions, as we have shown in Chapter III. The Committee failed to understand this dual function of all examinations.

CO-ORDINATING EFFECT OF EXAMINATIONS. In Chapter III we discussed the reasons why examinations have the power of linking school with school, teacher with teacher; this power is also stressed in the above quoted passage. Sir Michael Sadler has drawn attention to the part played by scholarship awards in connecting parts of an otherwise unco-ordinated educational system in his interesting essay, *The Scholarship System in England since the Reformation*.¹ Writing about the period 1850-1890, he states:

In spite of the influence of great contemporary writers, no attempt was made to grapple with the question [of education] as one affecting the whole nation and inseparable from the part which its citizens might be called upon to play in future in world affairs. Except for the scholarship system, which slowly extended its ramifications, there were few bridges between the schools attended by the mass of the people and local secondary schools [at p. 74].

And

The efforts of the English reformers... were least effective along the selva of each too-self-contained province of education. Scholarships were the threads which, however inadequately, attached the separate parts of what should have been our national system [at p. 75].

¹ International Institute Examinations Enquiry, *Essays on Examinations*, Macmillan, 1936.

By 1911 these scholarship threads which appeared as numerous scholarship examinations were supplemented by examination ties which were not necessarily concerned with scholarships. The system of exemptions from one examination by means of another, as well as the network formed by the Local Examinations, London Matriculation, etc., were a most important co-ordinating influence, which the Consultative Committee sought to improve by bringing the different examinations into closer relationship with one another. Perhaps their most important proposal was for a conference of universities. Whether this actually took place, I have not discovered, but it remains the crying need to-day, a whole generation later.

We need not consider further the recommendations of the *Report*. Our interest lies in the reforms which were introduced a few years later as a result of the *Report*, and these will be discussed in the next chapter.

CHAPTER V

SCHOOL EXAMINATIONS, 1911-1942

EXTERNAL examinations were not the only unifying influence in the educational system during the period we have been reviewing. Let us mention briefly some of the other institutions which had their roots in the same period, and which have played an increasingly important part in welding the system together.

(1) *The Board of Education.* Although the Board did not come into being as a Government department with Cabinet representation until 1899, there had been a Central Education Department since 1839. Each successive Education Act led to the allocation of public money to different types of school, and this was naturally accompanied by control through the medium of inspectors, regulations, etc., all of which had an important unifying effect. But, on the whole, such control has been in the realm of organisation and finance rather than curriculum and syllabus. Since 1918, the Board of Education has acted mainly, though not entirely, through the examination system when it has desired to influence secondary school curricula.

(2) *Local Education Authorities.* Since the establishment of County Councils in 1888, and the first appearance of County Secondary Schools at the beginning of the century, the public ownership of schools has grown progressively. Here again, however, the control of the curriculum is far from being in the hands of the Local Education Authorities, because the various public examinations have always exerted a great influence on the teaching; and, recently, the School Certificate and Higher School Certificate Examinations have been the main instrument of official policy on matters of curriculum, although these examinations are not directly controlled by the Board of Education.

(3) *Associations of Teachers.* The growth of secondary school education has led to a great development of the teaching

profession, and to the establishment of powerful Secondary Teachers' Associations now known as the 'Joint Four'—the Associations of Headmasters, Headmistresses, Assistant Masters and Assistant Mistresses respectively. These voluntary associations, to which must be added the Associations of Educational Officers, the Independent Schools' Association, and the Headmasters' Conference (confined to the headmasters of public schools), represent most important democratic organs in the educational world, whose annual conference decisions command respect over wide fields. We must also note the various subject associations, such as the Science Masters' Association, the Mathematical Association, and the Modern Languages Association, which include within their membership not only school teachers, but also university teachers and others interested in the subject, and so exert a co-ordinating effect of a special kind. All these associations have influenced the development of secondary school examinations.

(4) *The Publication of Textbooks.* Anyone who is old enough to look back thirty years to his schooldays must be struck by the enormous increase in the number and variety of school textbooks now in use. These textbooks have a powerful influence over what is taught in schools. They are written mainly by active school and university teachers, and thus enable ideas to travel from school to school, and from university to school. They are closely bound up with the examination system, apart from which their production and function cannot be fully understood.

(5) *The Training of Teachers.* The school teacher begins his career a slave to his previous education. Of course, the good teacher soon modifies this by learning rapidly from experience, but, even so, the educational background shared by teachers is an important unifying influence for good or bad in the educational world. The university honours courses and their own schooldays are the main sources of knowledge and inspiration of the teachers with whom we are concerned. In this indirect way the university teacher plays a vital role in school education. One university don in his time is able to transmit

his ideas to hundreds of schools and thousands of children; yet he has no means of acquiring knowledge of school problems unless he happens to be a School Certificate or Higher School Certificate examiner.

We have not mentioned teachers' training courses, because they still play a minor role in secondary education. Only a proportion of secondary school teachers, and few public school teachers, attend any teachers' training course to complete their university education.

At the beginning of the period with which we are now dealing (1911-1942), secondary and university education may be viewed as a number of separate strands, each with its own history, and still imperfectly connected. The various external examinations had woven their way among these developing strands on the basis of free and uncontrolled competition, and still formed the main connecting links in the realm of curriculum. The *Spens Report* (1938), looking back after more than twenty years, summarises the arrangements made on the basis of the 1911 *Report* for adapting these examinations to the new needs as follows:

The history of the School Certificate Examination as now organised and conducted by the various examining bodies may be said to begin in 1912, when the Board of Education, after considering our Report on Examinations in Secondary Schools, addressed a letter to the Universities inviting them to confer on the scheme of examination which the Board had prepared as a basis of discussion. Subsequently, in Circular 849 the Board invited criticism of these proposals from local education authorities and other bodies and persons responsible for the management of Secondary (Grammar) Schools or interested from various points of view in the question of school examination. The Board also consulted a number of professional bodies with regard to the acceptance of certificates for the purpose of entry into the professions.

From Circular 849 and subsequent circulars it is possible to learn the principal objectives of the Board's proposals, and the character of the examination which they contemplated. Among the former was a desire to limit the number of examinations which might be taken by pupils in Secondary (Grammar) Schools. It will not be disputed that this end has been secured by the establishment of the 'First' or School

Certificate Examination intended for pupils about the age of 16. 'Even its critics', it was stated in evidence, 'will agree that it has served a very useful purpose in freeing the Secondary Schools from the nightmare of a multiplicity of external examinations.' The simultaneous recognition of the 'Second' or Higher Certificate Examination, intended for pupils about the age of 18, further clarified the position by removing the temptation to try to provide in one examination for two different classes of candidates. Further, it was proposed that the Universities should be recognised as the responsible bodies through whom the examinations in Secondary Schools should normally be conducted, and that in order to secure the necessary equality of standard and to provide machinery for enabling the scheme to be improved from time to time the Board of Education should perform the function of a co-ordinating authority with the help of an Advisory Committee containing representatives of the Universities and of local education authorities. This Advisory Committee was established in 1917 and designated the Secondary School Examinations Council.

It was a further point in the Board's proposals that the School Certificate Examination should not have the entirely external character which belonged to former examinations, and 'that Teachers should be brought into touch with the Examining Bodies by some system of representation or consultation; by the right to submit their own syllabuses for examination; and by a provision that Head Masters and Head Mistresses should submit their estimate of the merits of candidates from their schools in each of the subjects for examination' (*Spens Report*, at pp. 254, 255).

This plan for rationalisation was extremely cautious and we are suffering to-day, twenty-five years later, from a failure to improve it as defects revealed themselves. But we should not underestimate the advance that was made when the universities were persuaded to modify their examinations and co-operate in a common plan.¹ A brief glance at the members of the mixed

¹ 'No-one who can remember the welter of examinations in the years before the War [1914-1918], for which schools had to prepare pupils who desired to enter particular professions, can doubt that the institution of a single examination has simplified the work of the schools enormously, and no one will dispute that under proper conditions they are a necessary and a valuable part of the educational machinery of a good school system' (*Spens Report*, p. 142).

team¹ of which the Board of Education was electing itself the none-too-popular captain, is enough to remind us of the advances of the last twenty-five years. The ancient Universities of Oxford and Cambridge had been in the field for sixty years. Their Local Examinations had the prestige of the universities behind them, and were more difficult to pass than the proposed new School Certificate Examination. It was no mean achievement to persuade them to enter on terms of equality the same team with quite newcomers to the examination world. Moreover, these universities also controlled the 'Joint Board' Examinations which were taken by the most powerful schools in the country. Between them, these three bodies must have been able to command a large number of votes in the House of Commons, and had, therefore, to be treated with respect. London Matriculation was another examination with a great reputation, and the new London General Schools Examination was able to take the field under the protection of its elder brother 'Matriculation', and to offer the double prize of a school certificate and special facilities for obtaining exemption from London Matriculation. There was also the entirely new Northern Universities Joint Matriculation Board, instrument of the Universities of Liverpool, Manchester, Leeds, Sheffield, and Birmingham, which, under the able direction of its first Secretary, Dr Crofts, was showing how statistical methods could be applied to school examinations, and soon became a most formidable and efficient examination machine. The smaller Durham and Bristol Boards were never able to compete on equal terms with these powerful rivals, each of which had a

¹ The eight approved School Certificate and Higher School Certificate Examinations were those conducted by:

- The Cambridge Local Examinations Syndicate;
- The Oxford Delegacy for Local Examinations;
- The Oxford and Cambridge Schools Examination Board;
- The University of London;
- The Northern Universities' Joint Matriculation Board;
- The University of Durham;
- The University of Bristol; and
- The Central Welsh Board.

definite subsidiary advantage to offer in addition to the School Certificate itself.

Over against the continual rivalry between the different bodies, there was the solid advantage offered by the Board of Education in the examination fees which were available only so long as the examination in question retained the Board's recognition and therefore submitted to such slight measures of control as were imposed. Twenty-five years have seen this team brought into a fair degree of harmony by the interaction of the centralising influence of the Board of Education and the Secondary Teachers' Associations on the one hand, and their mutually conflicting interests on the other.

The Secondary School Examinations Council was originally composed of twenty-one members, of whom ten represented the examining bodies, six were appointed by the Teachers' Registration Council, and five represented Local Education Authorities. The Chairman was appointed by the Board of Education. The ultimate power of control over the examining bodies was that exercised by the Board of Education through its 'approval' granted to the examinations. If this approval were withdrawn from an examination, the Board would no doubt withhold from the schools or Local Education Authorities its grant towards the examination fees of candidates entered for it. The Secondary School Examinations Council advises the Board of Education on matters related to the examinations, but the Board is not bound to follow the advice, and has, in fact, not always seen its way to do so. This division of responsibility has been unfortunate, and has probably been partly responsible for the fact that the Council has not established itself as an important educational body and that the universities have failed to utilise it as a means of co-operation with each other, with the schools, and with the Board.

When constituted, the Secondary School Examinations Council may have been suitable for the preliminary task of co-ordinating the work of the eight bodies and representing them in negotiations with professional bodies about exemptions by means of the School Certificate. But the very success of its

early work brought a need for much closer collaboration which the Council proved quite incapable of fostering. In the early days, it was a matter of interest and importance to know how the methods and standards of the different bodies compared, and the elaborate and expensive 'Investigations' arranged by the Secondary School Examinations Council probably justified themselves. But it soon became important, not only to know what divergencies there were, but to arrange for joint consultation between those responsible for the examinations on a sufficiently detailed scale to reduce these divergencies. So far as I know, the Council has never called together a meeting of the specialists concerned in arranging and carrying through the examinations in any given subject. It has established itself as a discussion forum and has occasionally succeeded in persuading the Board of Education to sanction minor reforms, but its faith in the outworn practice of publishing official reports and hoping that reforms will follow, has not been justified. It has not met since 1940.

The Investigations of the various examinations were formal affairs, conducted on the model of full-dress inspections of secondary schools. In each subject three 'Investigators' were appointed—generally one of H.M. Inspectors, a school teacher and a university teacher. The whole team visited the eight examining bodies in turn; they were always received with courtesy and generally given all the information and facilities they asked for. Finally, two reports were produced, a general report, which was published by H.M. Stationery Office, and a series of more detailed reports which were communicated privately to the individual examining bodies. I cannot speak with personal knowledge about the earlier Investigations, but my impression (from the point of view of an examining body) of those of the Higher School Certificate in 1926, and on the School Certificate in 1931, was of their externality. There was nothing to suggest that the examining bodies were partners in a joint enterprise, and the feeling prevailed that we were being judged by outsiders, and not by a body on which we were strongly represented. The 1937 Higher School Certificate

Investigation was more co-operative, but it left me with the impression that the ends it had in view, namely, co-ordination of State Scholarship standards, could have been more satisfactorily solved, and £400 more usefully spent, by arranging for joint consultations between the examining bodies themselves, both in individual subjects and in relation to general policy.

The Investigators' School Certificate Report (published 1932)¹ gives an admirable summary of the intentions of the Board of Education in 1918, and of the main problems that had revealed themselves after nearly fifteen years' experience of the modified system. On p. 11 we read:

The underlying principles are set out in Circular 849 and subsequent Circulars from which the following quotations are taken. The First (or School Certificate) Examination was to be 'suitable for Forms in which the average age of the pupils ranges from about 16 years to 16 years 8 months', i.e. it was to be a 'Fifth Form' Examination. It would be 'designed to test the results of the course of general education before the pupil begins such a degree of specialisation as is suitable for Secondary Schools', and 'based on the general conception of the Secondary School course up to this stage'. Further, 'it is a cardinal principle that the Examination should follow the curriculum and not determine it'; also, 'the Form, and not the individual, will be the unit for the Examination and it is contemplated that a large proportion of the pupils in the Form should satisfy the test'; again 'the standard for a pass will be such as may be expected from pupils of reasonable industry and ordinary intelligence in an Efficient Secondary School'. Lastly it was assumed, and accepted in theory by the Examining Bodies, that the examination would be conducted on the principle of 'easy papers and a high standard of marking'.

It will be seen that the Board were not prepared to admit that the examinations should influence the work in the schools; they were merely to 'test' that work. This failure to understand the nature of the examinations with which they were dealing seems to me to have been one of the main causes of the Board's failure to secure the degree of co-operation and co-ordination

¹ *Report of the Panel of Investigators appointed by the Secondary School Examinations Council to enquire into the eight approved School Certificate Examinations held in the summer of 1931.*

between the eight examining bodies themselves, and of these bodies with the Board, which was clearly contemplated by the 1914-1918 circulars and the *Investigators' School Certificate Report*. The 'cardinal principle that the examinations should follow the curriculum and not determine it' came to be almost universally accepted at its face value. From my experience I can say without hesitation that the examining bodies have done their best to translate it into practice. Their complete failure to do so is described as follows in the *Spens Report*:

...our witnesses are almost unanimous in their opinion that, despite all safeguards, the School Certificate Examination has not escaped the danger proverbially inherent in all machinery, and now dominates the work of the schools, controlling both the framework and the content of the curriculum [at p. 142].

The extent to which this domination has grown may be judged by the fact that most of our witnesses seemed unable to think of the curriculum except in terms of the examination, while some defined the curriculum entirely in such terms [footnote, p. 142].

Although very definite that the examinations are not to determine curriculum, the Board of Education has failed to say what *is* to determine it. They have tried for thirty years to ignore the verdict of nearly a hundred years of external examinations that, in spite of all efforts to the contrary, examinations are one of the main instruments in determining what is taught in all educational establishments from universities, technical colleges and schools, to sessions with private tutors and homework hours in English parlours. Instead of crying for the moon with their 'cardinal principle' the Board should have been sufficiently realistic to say: 'these examinations will play an important part in determining the curriculum'. We should then have had a much more constructive appreciation of the possibilities as well as the shortcomings of the School Certificate Examination.

It is only fair to say that the Board's officers have often been more realistic than those who formulated their 'cardinal principle'. Secretaries of examining bodies know that the Board has not been above approaching them when it has wished

to see some change in syllabus or treatment of a subject in the schools. And it is an interesting fact that 'the *Investigators' Report* itself, although paying elaborate homage to the 'cardinal principle', is full of proposals for using the examination to modify the curriculum.

The slogan 'easy papers and a high standard of marking' has also seemed to me to be an unhelpful one. There are many considerations to be taken into account in settling the character of the question papers and of the marking. It is true that inexperienced examiners left to their own devices do generally set papers that are too hard, and then try to correct the mistake in their marking. But to reduce the complex problems of the examiner to this over-simplified slogan shows little real familiarity with the problems. It is quite possible to set a paper which is so easy that no degree of severity in the marking will differentiate the candidates from one another.

These two examples indicate that the attempt to control examinations from without, by laying down principles *ex cathedra*, is apt to pass over the real problems. The Board themselves realised this when they established the Secondary School Examinations Council as a co-ordinating body. But the members seem to have tacitly accepted the Board's analysis of the functions of examinations and the principles on which they should be organised as the last word on the subject. It was left to the Secondary Teachers' Associations and to certain of the examining bodies themselves to take the initiative in adapting the system as best they could in the absence of any effective lead from their co-ordinating body.

It is impossible in the space at our disposal to give an adequate account of the problems which are described fully in the *Investigators' School Certificate Report*, especially in relation to the structure of the School Certificate Examination itself. We will content ourselves with noting the main points and correcting some false impressions left by the *Report*. For convenience we classify these points under the three headings: *Co-operation with Schools*; *'Matriculation' and 'Intermediate' Examination and the Award of Scholarships*; and *Construction of Syllabus*.

CO-OPERATION WITH SCHOOLS. The Board of Education Circulars referred to in the passage quoted above (*Spens Report*) envisaged three forms of co-operation with schools, namely, 'some system of representation or consultation', 'the right to submit their own syllabuses for examination', and school estimates of the merits of candidates in each subject of the examination. Each of these probably already existed in one or more of the existing examinations. The Northern Universities Joint Matriculation Board certainly already included teachers among its members, although these were co-opted and not appointed by the Teaching Associations. The right of schools to submit their own syllabuses was introduced by London in 1902, and it seems probable that the Northern Universities Joint Matriculation Board were experimenting with school estimates during 1910-1918.

All the examining bodies (except the Oxford and Cambridge Joint Board which had a special problem since it dealt mainly with public schools) followed the advice of the Board of Education at an early date and devised machinery for consultation with official representatives of the four Secondary Teachers' Associations and the Independent Schools' Association. The representatives were selected by the Associations from schools taking the examinations of the examining bodies concerned; in some cases they served on a standing committee, in others, they were summoned annually to a conference.

Looking back over this period, I see the campaign for greater co-operation with schools as a struggle waged by the teachers, through their Associations and with the support of the Board of Education Inspectorate, against the universities represented by the examining bodies. The committees and conferences with the individual examining bodies and the Secondary School Examinations Council provided a series of meeting grounds for the two parties. To-day, they have lost this particular significance, because the battle has so far been won that the examining bodies are themselves constituted to form fairly satisfactory meeting grounds for discussion between universities and schools. During a period of about fifteen years

the examining bodies were transformed from a set of university bodies considering themselves set apart from and above the schools, to the present stage in which they all include teachers and local education officers among their members. The success of the Teachers' Associations may be attributed to two factors. The first was the obvious justice of their contention that the examinations, and especially the School Certificate Examinations, were more the concern of the schools than of the universities. The second was the competition and lack of co-operation between the examining bodies; when approaching one body, the teachers were often able to cite the success of some step towards co-operation taken by another body.

The Northern Universities Joint Matriculation Board and London soon became by far the largest examining bodies, and were forced by the number of scripts to be marked to turn to the schools for a large proportion of their examiners. London developed a system by which teachers in schools taking the examination could be included in the teams of examiners; the Northern Universities Joint Matriculation Board worked with teachers from schools taking the examinations of other bodies. The inclusion of a large proportion of teachers among the examiners became one of the planks in the programme of School Certificate Examination reform.

The Local Examinations had established a sound tradition that results should be communicated to candidates and schools in the form of symbols representing various grades of performance in each subject.¹ This practice solved the difficulty that the actual marks of the examiners depended as much on the question papers and system of marking as on the candidates.

¹ Writing in *The Times Educational Supplement* on February 6, 1912, Mr F. H. Colson said: "The Cambridge Syndicate are ready to issue for each student "detailed reports", which class his work in each subject according to six standards: "distinguished", "good", "moderate", "pass", "failure", "bad failure". Owing to the large area from which the results are drawn and the stability of the examining body, these standards may be expected to have a constant value, and experience shows that they have."

Sixty per cent of the 'raw' marks awarded did not necessarily denote a comparable standard in different subjects, or in the same subject in different years, but the symbols used for 'pass' or 'very good' need not correspond to the same raw marks in different subjects and different years. They could be fixed so as to represent the examining body's considered opinion as to which candidates had reached the given standard. One of the methods of fixing these standards was to keep the proportion of candidates reaching them constant from year to year, on the basis that, while the work in individual schools might vary from year to year, the average standard of thousands of candidates drawn from many different schools would not. This system of symbols had its drawbacks, however, for it did not indicate to the schools whether a given candidate was near the top or bottom of his grade. It was probably for this reason that the Northern Universities Joint Matriculation Board¹ issued actual marks for the confidential use of the schools as well as symbols for the candidates. The inadvisability of issuing 'raw' marks was obvious,² so the Northern Universities Joint Matriculation Board arranged for the latter to be sufficiently standardised to make the credit mark the same in every subject. The issue of confidential marks to schools became another plank in the platform of School Certificate Examination reform.

All the examining bodies utilised the principle that the percentage of candidates reaching a certain standard in a largely-taken subject should remain constant from year to year. But

¹ It was natural that the lead in co-operation with teachers and in examination technique should be given at this time by the Northern Universities Joint Matriculation Board. This Board, besides including two headmasters and two headmistresses, had the advantage of entering the field comparatively unfettered by tradition. If we refer to this Board as being the most advanced of the examining bodies in the 1920's, this is no reflection on the others which had each played this part in turn.

² The Oxford and Cambridge Joint Board also issued confidential marks, thus demonstrating the spirit of co-operation with schools in which the Board had been conceived. The marks in this case however were 'raw' marks.

the Northern Universities Joint Matriculation Board went a step further and laid it down that about 50 per cent of the candidates should reach credit in all the main subjects. This was a necessary preliminary to the use of statistical methods in standardising marks. After each examination they published the actual percentage of credits in each subject, thus enabling schools to compare their own results in each subject with the average for all schools. This led the schools taking other examinations to enquire what proportions of credits were awarded in each subject. The publication of credit percentages was the next plank in the reform platform.

The submission of 'School Records' by teachers has not proved an important factor in co-operation. The *Investigators' School Certificate Report* states:

Up to 1921 the submission of School Records was compulsory in all the examinations.

In that year owing to representations made by one Examining Body, prompted thereto by the schools, the Council decided, and the Board agreed, that while approving the principle that School Records should be asked for, it should be left to the Examining Bodies to make their own requirements in the matter. At the present time only one Examining Body makes the submission of a School Record compulsory, but save in one examination it is the general practice of Examining Bodies to invite schools to submit these records. A record may consist not only of a list of the candidates in order of merit for each subject but may include the marks which it is thought that each candidate should score [at pp. 44, 45].

The Northern Universities Joint Matriculation Board have made systematic use of these records, employing statistical methods for comparing the estimates sent in by each school in each subject with the examination marks, and then, on the basis of their reliability thus tested, giving candidates on the borderline an allowance when the school record places them higher in their form than the examination. Cambridge abandoned the use of estimates in each subject and introduced a different form of estimate in 1932. This different procedure arose out of differences in the technical methods of the two Boards (see Appendix I). The war has brought school records

to the fore again.' In 1940 and 1941 it was always possible that particular candidates might be prevented from taking the examination. School records submitted before the examination were thus held in readiness to make good deficiencies in the examination. This led Cambridge to require schools to estimate the subjects in which each candidate might be expected to pass or gain credit respectively.

Finally, the difficulties of evacuation, air raids, and loss of staff during the last three years have led the examining bodies and the schools themselves to accept the principle that allowance in the examinations shall be made to candidates at certain schools. This is, in effect, recognising the principle of handicapping in the competition between schools. It leads us further in the direction of co-operation, carrying the process to the point when the schools themselves agree to make concessions to each other, an important step in building a system of external examinations run by the schools for the schools.

More remarkable has been the failure of schools to take advantage of the right to submit their own alternative syllabuses in any subject. The examining bodies all report that very little use has been made of this facility. Schools appear to welcome the opportunity of working to a common syllabus, although it would be wrong to assume that they necessarily approve the syllabuses in use.

Another important step towards co-operation with schools was the appointment by each examining body of an External School Moderator (or Reviser) in each subject. The Moderator has an opportunity of seeing the question papers in proof and submitting his comments. His duty is to judge from his experience as a schoolmaster whether the question papers are suited to the school children who will be taking them. Now that a large proportion of the examiners and chief examiners are school teachers, the importance of the Moderator is reduced. He no longer stands as the sole representative of the schools in a predominantly university activity. In the Higher School Certificate Examination, however, he still fulfils a very necessary function.

A word must be said about the Higher School Certificate Examination. For a long time the universities took the attitude that, while the School Certificate Examination was clearly the concern of the schools, this could not be said of the Higher School Certificate. It was said that school teachers were not qualified to examine at this level, and that the universities had to safeguard their position because of the Intermediate exemptions and the scholarship awards which were settled by this examination. History has, however, shown the same tendency to transform the Higher School Certificate Examination into a joint activity of school and university. To-day, the universities rightly take a larger proportionate part in the higher examinations than in the lower, but co-operation has reached an advanced stage to the benefit of all.

‘MATRICULATION’ AND ‘INTERMEDIATE’ EXEMPTION AND THE AWARD OF SCHOLARSHIPS. One of the main causes of dissatisfaction with the School Certificate Examination was soon traced to the influence on it of London Matriculation. Writing in 1938, after the problem was well on the way to being solved, the *Spens Report* sums up the position as follows:

A dominant cause of the pressure exercised by the preparation for the Certificate Examination is the fact that the examination has been used at the same time for two distinct purposes—to test the results of the first stage of the education provided by Grammar Schools, and also to enable the pupils of those schools to obtain a certificate acceptable for the purpose of matriculation.

Circular 849, expressing the original conception of the examination, stated that, if the examination were conducted on the principles of easy papers and a high standard of marking, the difference between the standard for a simple pass and that required for matriculation purposes would not be so great as to prevent the same examination being made to serve both purposes; and with that object a mark of credit was to be assigned to those candidates who, in any specific subject or subjects, attained a standard which would be appreciably higher than that required for a simple pass. The practical convenience of this arrangement was obvious. The abler pupils intended for the Universities would take one examination instead of two, and the organisation and time-tables of schools would to that extent be

simplified. Experience, however, has shown that the attempt to combine the two different objects in one examination has been disastrous. A 'matriculation certificate', which should mean nothing more than a certificate entitling the holder to admission to a University, has come to mean a superior kind of school certificate with its own special value in the eyes of employers and the general public, and to be the 'aim of thousands of Secondary School pupils who neither intend nor desire to enter the doors of a University'. Indeed many children (and their parents) are oppressed by a mistaken sense of failure if they obtain a School Certificate but do not satisfy the regulations which make it a 'matriculation certificate'.

Though our evidence leads us to believe that employers are becoming more familiar with the meaning of the School Certificate and more aware that the Matriculation Certificate does not by any means necessarily imply a higher educational performance, the traditional respect for matriculation and especially in certain circles for 'London Matriculation' [footnote in Report: Which is more than ordinarily rigid in its requirements] still prevails in the minds of many people not interested in education except as a preliminary to employment; and Head Masters and Head Mistresses are in consequence often urged by parents to enter their children for matriculation when on educational grounds it would be far better for them to take a different selection of subjects in the School Certificate Examination. The choice of subjects already restricted by the 'group' requirement is still further narrowed by the requirements for matriculation. 'Subjects which are of no value for matriculation purposes are definitely at a disadvantage. Nor would this matter seriously, if only those pupils were concerned who proposed to proceed to a University. In fact matriculation requirements dominate the situation... This goes far to render nugatory the idea of the School Certificate Examination as essentially an examination which provides a test of the Secondary School curriculum, but does not itself determine the curriculum' (Report of the Panel of Investigators, p. 50).

With regard to the content of the curriculum, the association of matriculation with the School Certificate Examination has, perhaps, been most unfortunate in diminishing the importance attached to those practical and aesthetic subjects which were not at first permitted to count on an equality with others towards the award of a Certificate. We recognise that there have been other causes why, particularly in boys' schools, the development of these subjects has lagged behind that of others—the prevalence of a strong tradition in favour of those subjects which a university degree best qualifies a man to teach, the qualifications of existing staffs and in many cases the lack of adequate

facilities for pursuing those subjects which require more practical work. Nevertheless it must be held that *the conjunction of the Matriculation Certificate and the School Certificate has helped to upset the balance between what are conventionally known as academic and non-academic subjects, which we believe should be maintained* [at pp. 258, 259].

Here again, the *Report*, basing itself on the *Investigators' School Certificate Report*, failed to disclose the real trouble, which was that the simple School Certificate Examination did not differentiate sufficiently between the better and the average students. Employers naturally wanted to know which boys and girls were in, say, the best third or the best half of those taking the examination. By making the pretence that all School Certificates should be of equal value, the authorities played into the hands of 'matric'. Employers may not have understood much about the School Certificate, but they soon realised that it was not necessarily equal in value to a Matriculation Certificate. Candidates naturally tried to secure the highest qualifications within their powers. If the Secondary School Examinations Council had instituted two grades of School Certificate and let it be widely known that the higher grade was equal in difficulty to matriculation, they would have had a weapon with which to combat the trouble. Provided the higher grade certificate had been awarded on the same broad basis, i.e. a wide choice of subjects, as the ordinary certificate, and on the same examination, the difficulties mentioned in the above extract could have been surmounted.

The confusion on the Secondary School Examinations Council about this matter of differentiation between candidates at different standards is well illustrated by their reversal of policy on Honours and Distinctions. The old Local Examinations graded their candidates into First, Second, and Third Class Honours, and Pass. The London General Schools Examination also awarded Honours Certificates. Several of the examining bodies award 'Distinction' to the top 2 or 3 per cent of candidates in each subject. The excessive competition between schools for these Honours and Distinctions led to a concentration by the teachers in some schools on the best boys

and girls at the expense of the ordinary run of students, and the Teaching Associations and the Secondary School Examinations Council gradually persuaded the examining bodies to abolish these classifications. Thus, in the Cambridge Examinations the three classes of Honours were replaced by a single Honours class in 1923, the year in which the name of the examination was changed from Senior Local to School Certificate. In 1934, both Honours and Distinctions were abolished. For five years there was no differentiation between good and weak candidates except by the number of credits obtained, but in 1939 the Secondary School Examinations Council instituted a new 'very good' standard in each subject, which was to include about the best 10 per cent of the candidates in the subject, and this was recorded on the certificates of successful candidates. This amounted to the virtual re-institution of Distinctions. In the Cambridge examination, three grades of certificate were instituted for Oversea Centres (which were outside the jurisdiction of the Secondary School Examinations Council) in 1934. The first, awarded to about 12 per cent of the candidates, corresponded to the old Honours, the second, comprising a further 20 per cent, corresponded roughly to matriculation standard but was awarded on the candidate's aggregate marks, provided at least four credits were included.

To get a proper appreciation of this problem, we have to remember that the examination strings the candidates out into a continuous sequence, both in the separate subjects and in the examination as a whole. It proves to be convenient to divide up this series artificially into sections. In the individual subjects these sections are given the names, 'very good', 'credit', 'pass', 'fail', corresponding to the best 10, 50, 80 per cent, and the worst 20 per cent, respectively. In the examination as a whole, the series has been officially divided into only two sections, 'pass' and 'fail', representing about 80 and 20 per cent of the candidates respectively, but exemption from matriculation has, in fact, constituted a further division corresponding to perhaps half the candidates.

These classifications have a twofold value. They provide the candidates with various goals, and they supply a simple criterion for those wishing to select students for future activities. The dividing line should be chosen so as to serve these two ends. Those who advocate the removal of differentiation between the successful and unsuccessful candidates by awarding to every candidate a simple record of his achievement, should consider the matter in this light. It is difficult to give a meaning to a measure which is not cut up into convenient bits. Time *could* be measured solely in seconds or in days, but it is doubtful whether people would get used to saying that the duration of the journey from Cambridge to London is 5400 seconds, or the time required to boil an egg is one-three hundred and sixtieth (or 0.0028) of a day. If we gave up these classifications in examination results and described a candidate as in the 25th percentile (or having 60 per cent) in history, the 14th percentile (or having 65 per cent) in geography, and the 17th percentile (or having six credits, including three 'goods' and one 'very good') in the examination as a whole, the danger of misunderstanding would be greater than at present, and it is difficult to see who would profit.

The Spens Committee assert that 'the attempt to combine the two different objects [of selecting students for the university, and testing the schoolwork of the remainder] in one examination has been disastrous'. This false analysis which is now being widely applied to the Higher School Certificate Examination is discussed on p. 113.¹ For the present, let us ask ourselves the question: Should both these types of student be taught in the same class of the same school? If they should, it is natural to assume that they are all *potentially* suited to a university training, and there is therefore no reason why the same examination should not cater for both. If not, they should be placed in different classes or in different parts of a multi-lateral school. The problem thus resolves itself into devising a curriculum for a batch of students, some of whom will go on to a university, some of whom will not. It seems to me that

¹ See also Chapter x.

students who are, at any stage of their education, potentially capable of going on to any one of several different careers, should have a common curriculum agreed upon by those who know the needs for each career. This is the best safeguard against what has come to be called 'over-specialisation'.

Let us apply this principle to the influence of matriculation on the School Certificate Examination. If, as the Spens Committee asserted, matriculation requirements were restricting the curriculum of non-university students, it follows that the training of future university students, as determined by matriculation requirements, was too specialised and academic. Universities and professional bodies seem to be agreed that at this stage they want their students to have as broad an education as possible. We need therefore to see a reversal of the state of affairs in which the influence of the School Certificate Examination on the school work is affected adversely by university requirements. We want, instead, university requirements brought into line with the broad education which the schools wish to give.¹ The universities should formulate a common policy as to what they require of their entrants and then work out with the examining bodies how, by means of the School Certificate or Higher School Certificate, or both, they are to secure it. We cannot any longer afford the luxury of quite different entrance requirements for the different universities.

Plans were being made by some of the universities before the war to transfer the matriculation requirements partly from the School Certificate to the Higher School Certificate Examination, and probably this would have gone a long way to removing the restricting influence of matriculation on school work before the School Certificate stage. But a similar problem is now arising at the Higher School Certificate stage in relation to exemption from the Intermediate examinations of the different universities, and the award of scholarships tenable at the universities.

¹ London University has already gone some way in this direction by broadening the basis of matriculation exemption.

The Higher School Certificate has been partly a means of recruiting to the universities. Thus the Northern Universities Joint Matriculation Board Examination feeds the five universities with students who have been through advanced courses in the secondary schools in the North and Midlands. For these students the actual certificate may be a secondary consideration compared with the securing of exemption from the Intermediate examination of one of the universities, or a scholarship from a County Council, both of which may be secured through the Higher School Certificate Examination. The position of the London Higher School Certificate Examination is similar: in fact, that examination has been designed with exemption from London Intermediate as one of its main objects. The existence of the London external degree means that boys and girls who will not become internal students at any London college, can secure the first stage of a university degree by means of the Higher School Certificate. Until 1939, exemption from London Intermediate was not granted to holders of Higher School Certificates other than London, but, in that year, the university extended the privilege to all Higher School Certificate holders who satisfied the necessary conditions. Since then, many students have had London Intermediate as a secondary objective when taking the Oxford or Cambridge Higher School Certificate Examinations.

The position of students proposing to enter Oxford or Cambridge Universities differs from that of students going to other universities in four respects, namely, the reputation of the degrees obtainable, the high cost of the university course, the existence of the College Entrance Scholarship Examinations, and the absence of any Intermediate examination which can be taken before going into residence. In 1936, over 80 per cent of the State Scholarships awarded on all Higher School Certificate Examinations were taken up at Oxford or Cambridge, so that these scholarships are linked in a special way with these two universities. At one time, the Oxford and Cambridge Joint Board Examination did for the two ancient universities what the Northern Universities Joint Matriculation

Board now does for the five northern universities. But the public schools no longer provide an overwhelming proportion of the freshmen at Oxford and Cambridge, so that all Higher School Certificates are equally important to these universities. However, the cream of the candidates taking the Northern Universities Joint Matriculation Board Examination are diverted from the five universities to Oxford and Cambridge through winning State Scholarships or Open College Scholarships, while comparatively few public school boys go to provincial universities. Oxford and Cambridge Universities exercise a greater influence on the work in schools through the College Scholarship Examinations than through the three Higher School Certificate Examinations controlled by the two universities, and, unfortunately, there is little co-ordination between university policy expressed through the Higher School Certificate Examinations, which seek to discourage over-specialisation, and college policy expressed through the Scholarship Examinations, which encourage boys to concentrate on a single subject;¹ this causes difficulty in those schools which send an appreciable number of boys to the two ancient universities. The Oxford and the Cambridge Higher School Certificate Examinations supply students equally to Oxford, Cambridge, and London Universities, and, in a lesser degree, to the other universities. In this respect, these two Local Examinations bodies are unique.

In the last two years an important new factor has been introduced into this complex process of transfer from school to university, in the shape of State Bursaries. We have seen the principle accepted that certain departments in all the universities should be filled to capacity by students, the whole of whose fees and maintenance expenses are paid by the Board of Education. The State Bursaries scheme sent boys to Cambridge University in 1941 who would not have qualified for one of the existing scholarships, and reports from the university show what good material many of them proved to be.

The *Investigators' Higher School Certificate Report* (published

¹ But see p. 71.

1939)¹ dealt mainly with scholarship awards. While I differ from the writers of Part I of this Report in a few details, I recommend it as a most able account of some of the technical problems of modern examinations. Besides making proposals for a more satisfactory allocation of State Scholarships among the candidates taking the Higher School Certificate Examinations of the different examining bodies, the Report suggests that the scholars shall be more evenly distributed between the universities. The Board's complete failure to take action on these proposals has done nothing to enhance the reputation of the Secondary School Examinations Council.

Unfortunately, the influence of Intermediate exemption on the Higher School Certificate Examinations had not become sufficiently clear in 1938 to lead the Investigators to pay attention to it in their *Report*. Their failure to do so may indeed be related to their false analysis of the function of the examination into two separate and conflicting parts, namely, selection of scholars and testing Sixth Form work. As we have shown, the various functions of examinations cannot be separated. It is only because the Higher School Certificate Examination selects scholars and gains exemptions that it has the power of testing Sixth Form work. Exemption from Intermediate appears to be a useful and legitimate function of the Higher School Certificate Examination, which is closely linked to the award of scholarships. We are suffering from a failure of the universities to co-operate with each other and with the schools so as to make the examination the servant of each. There is nothing to prevent schools and universities from agreeing on courses suitable for those who will go on to universities as well as those who will not. The examination can be modified to make such courses possible.

¹ *The Higher School Certificate Examination*, being the *Report* of the Panel of Investigators appointed by the Secondary School Examinations Council to enquire into the eight approved Higher School Certificate Examinations held in the summer of 1937, H.M. Stationery Office, 1939.

CONSTRUCTION OF SYLLABUS. This is a side of examinations that has received little consideration. The early syllabuses were probably prepared by one or two university teachers. Later, examining bodies came to realise that, however brilliant these individuals might be, their syllabuses were unlikely to prove entirely satisfactory unless considered and modified by a representative body. The practice of submitting syllabuses to conferences, often including both university and school representatives, became common. During the last few years more than one examining body, following the example of the Cambridge Syndicate, has set up representative standing committees responsible for keeping the syllabuses in their subjects up-to-date.

We have to note two important events in the period under consideration. After the last war, the difficulties introduced into geometry teaching by the departure from Euclid's strict treatment became sufficiently acute to make it advisable for a new series of theorems to be agreed upon. The matter was taken up by the Mathematical Association and the Assistant Masters' Association, and in 1923 the examining bodies adopted an agreed list of theorems. This first step towards common action in the matter of syllabus has not had entirely good results. Geometry teaching became set in a mould which, in the absence of the necessary machinery for joint action by the examining bodies, was never materially altered in the light of experience. Now it seems clear that a further step will be taken after, if not before the end of, the present war, so that less time need be spent in schools on what is in danger of becoming memory work, and more time may be available for application of geometrical ideas to trigonometry, surveying, navigation and other present needs.

The other event, relating to science syllabuses, was the publication by the Science Masters' Association of their *Report on General Science*. The two volumes of this *Report*,¹ which

¹ *The Teaching of General Science*, being the Interim and Final Reports of a Sub-Committee of the Science Masters' Association appointed in 1935, John Murray, 1936 and 1938.

include syllabuses carefully considered in relation to the time and equipment available in schools, have started a revolution in science teaching which will ultimately succeed in breaking the barriers between the separate sciences, and in allowing boys and girls to get an understanding of common, everyday phenomena. All the examining bodies now include General Science as a School Certificate subject in addition to the separate subjects, Physics, Chemistry, Biology, etc. As in mathematics, so in science, there is now a need for agreed action by the different bodies in order that the teaching may be allowed to develop satisfactorily.

Apart from these two examples and the acceptance by the examining bodies in 1930 of a syllabus in School Certificate Domestic Science drawn up by a joint committee of the Headmistresses' and Assistant Mistresses' Associations, there does not appear to have been any common action in the construction of syllabuses. We complete this chapter with an extract from the only section of the *Investigators' School Certificate Report* (1932) that deals with syllabus construction. Although the Investigators were alive to the shortcomings of the existing system, they had no proposals for improved machinery.

A critical attitude towards examination syllabuses and papers on the part of schools and responsible bodies of teachers is much to be welcomed, if it gives rise to constructive suggestions for reform and does not merely spend itself on minor complaints of only passing interest. But if the initiative lies with the schools, it is for the Examining Bodies after due consideration to respond. An examination system is indeed tolerable only if it shows itself fully alive to the progress of educational thought and opinion on matters affecting the content of school work in the several subjects [at p. 44].

Part II

PROPOSALS FOR REFORM

CHAPTER VI

DEVELOPMENT OF SYLLABUS

THE first part of this book has been devoted to the elucidation of general principles and an account of the way in which our present school examination system has arisen. We shall now consider what changes in organisation are needed in order that examinations may be adapted to deal effectively with present-day needs. In doing so we have to be on our guard against two dangers—planning utopian systems without sufficient reference to the existing system, and attempting to change what is, without clearly understanding where the changes will take us.

Bearing these dangers in mind, the reforms advocated in this and the following chapters are described in the order of their immediate practicability; syllabus problems being taken before examination problems because they can be solved without much reorganisation. Each proposed reform gathers up the threads of present tendencies and solves urgent outstanding problems. The reform is first stated as briefly as possible and this statement is followed by an analysis of the tendencies and problems out of which it has arisen. Finally, concrete ways are suggested in which all the parties concerned can move in the direction indicated in the brief statement. We have to remember that although it is essential to work towards a plan, the complex processes of historical development will evolve something less simple than a paper plan, but probably all the better for that.

In the present chapter, we confine ourselves to matters affecting syllabus, defining the general plan proposed, analysing present tendencies, and finally suggesting the best ways forward.

The general plan proposed for dealing with subject syllabuses is the setting up of a series of standing representative national councils, one for each main subject, to be charged with the co-ordination of existing syllabuses and their adaptation to present needs. These Subject Councils would take over from the examining bodies the responsibility of deciding what should be taught in schools.

The composition of such Subject Councils is best illustrated by means of examples. For instance, the Council for Physics might include representatives of the following bodies: secondary and public school physics teachers, university physics teachers, the Institute of Physics, the Air Ministry and Admiralty (at any rate, during the war), and the Board of Education Inspectorate, in addition to representatives of the examining bodies. The Council for Handicraft might include representatives of the Institute of Handicraft Teachers, the Loughborough and Shoreditch Training Colleges and the Board of Education Inspectorate, and the examining bodies. The constitution of a Council for English is less easy to predict, but besides university and school teachers, it might include a minority chosen from writers, journalists, science and modern language teachers, and business men.

When first advocating the institution of Subject Councils for science subjects (in the *School Science Review*, June, 1942), I stated their duties as follows: 'to formulate the collective experience of those represented on them and hence to make possible a progressive policy for the subject; to draw up in general or in detailed terms standard courses and to keep them up to date by continually omitting dead items and introducing new items; to secure such standardisation of nomenclature and treatment as they from time to time consider desirable; and to co-operate with the educational publishers and authors in the production of authoritative textbooks without discouraging individual effort in this field'.

In the early days of public examinations, the universities were gladly accepted by most of the schools as the final arbiters of what should be included in the syllabus and in the examina-

tion papers. I have included for comparison with their present-day counterparts the syllabus and some of the question papers used in the Cambridge Senior Local Examination in 1861, the third year of that examination (see Appendix II). To appreciate the significance of the comparison, one must think of the early examination in relation to contemporary events which have greatly influenced subsequent academic thought and school curricula. The examination was held soon after the publication of Darwin's *Origin of Species* (1859), and a few years before the invention of the Bunsen burner (1866), the appearance of the first German edition of Marx's *Capital* (1867), Mendeleeff's first paper on the Periodic Classification of the Elements (1869), and Clerk Maxwell's return to Cambridge to organise the new Cavendish Laboratory (1871). My own first impression on reading these early examination papers was one of horror at the way in which our school examinations have become stereotyped in the pattern of the Mid-Victorian era. But there is one important and significant difference to be noted—that the syllabuses for many subjects are now set out in much greater detail.

Standing as I have during the last fifteen years in a position between schools and university, I have noted a predilection of school teachers for a definite statement of syllabus, and of university teachers and examiners for vague, unspecified tradition. Syllabuses have progressively become more detailed as the school teachers have taken more interest and part in the conduct of the examinations. They naturally want to be sure just what their pupils will be expected to know. Even in the absence of any published statement, the tradition set up by a sequence of question papers in each subject forms a syllabus, and the university examiners welcome the latitude afforded by this method of defining what is to be known, because it leaves them a freer choice of questions.

I have found myself almost entirely on the side of the school teachers in their demand for a definite statement of the limits of what may be set in an examination, but a plausible case is often made on the other side. The definite syllabus may, it is

argued, constitute an unchanging mould into which successive teachers have to fit their lessons and examiners their questions, while a vague syllabus makes it easy for good examiners to keep the examination in touch with changing times. Definiteness is also said to encourage that terrible sin known as 'cramming'. The tendency of examinations to prevent the natural development of curriculum as the general level of teachers and students rises, and as technical knowledge advances, is the basis of one of the most serious criticisms that can be brought against them, so that the suggestion that this tendency is traceable to over-detailed syllabuses must now be considered.

The new examiner often approaches his task from a very personal angle. He has his favourite topics and ways of looking at his subject, and he tries, not unnaturally, to find out whether the candidates have seen things through the same eyes. He starts his career as an examiner with the illusion that he can test the candidates without also testing the teachers. He phrases the questions so as to present the subject in an unexpected form. Though novel types of question seldom elicit at once the hoped-for response, if they are repeated for a year or two they do ultimately modify the teaching and produce the kind of answers desired. But examiners are not permanently appointed and the next one to be entrusted with the task may have quite different ideas about the way the subject should be treated. Consistency therefore demands an agreed policy about the bounds within which the examiners must confine themselves, and, to some extent also, the attitude they must adopt. This may be partially attained if all questions have to be submitted to a meeting of experienced examiners, but in practice even this does not prove to be a safeguard against capricious questions leading to continually expanding syllabuses which set teachers and students an impossible task.

Vagueness in syllabus has in the past been fostered by a school of young romantics in the universities who are unwilling to admit that education is concerned with training people to do, know and understand certain things; and that when these ends have been achieved, the teacher has fulfilled his function.

These romantics^{*} are unwilling to allow the teacher to know exactly what he is expected to teach; or the student to know exactly what he is expected to become proficient in. I suspect them of wishing to retain a sacred territory for themselves which can be entered only by the élite. If this is the case, they are certainly wise to preach the doctrine that there are certain ideas that cannot be stated in words and a certain 'attitude' which no teacher can learn how to impart. It is only fair to say that this point of view is often a reaction against a tendency of mass education to reduce knowledge to an acquaintance with isolated facts without sufficient systematisation and without understanding those generalisations which form the principles of a subject. Advance in a new or rapidly developing subject depends on the formulation of general principles based on experience of separate cases. Similarly, these principles supply the key to understanding any established science or subject. The examiner is right to be on the look out for evidence that the candidate has grasped principles and not merely isolated facts. He makes a mistake, however, when he forgets that an acquaintance with the facts on which they are based is a first condition of understanding principles. Without this acquaintance, the principles themselves degenerate into isolated items to be learnt mechanically. So the university examiner sometimes becomes a romantic in his search for an understanding of principles by denying the teachers the material on which to build up that understanding. The teachers know that school boys and girls are at the stage of learning to understand facts in the light of principles, and that they cannot be expected to do much in the direction of applying as yet imperfectly grasped principles to quite new and unfamiliar facts. They demand to know what facts their pupils will be expected by the examiners to have studied, and what sort of interpretation of these facts the examiner will look for.

The printed syllabus in a subject was thus originally evolved as a necessary condition of carrying on an external examination in that subject. Devised by the examiners at the wish of the teachers, it formed a link between them. Later, it came to be

agreed rather than dictated, and instead of being a summary of what might be set by the examiner, it became an independent framework within which both examination and school course were built. As soon as machinery for drawing up and modifying syllabuses can be devised and accepted by the examining bodies and the schools, the Board of Education's cardinal principle that the examinations must follow and not determine the curriculum will come to life. But this machinery must be devised with the main object of enabling school work to keep in touch with the needs of the times. The framework must be flexible and capable of continual modification, so that it becomes, through the examinations built within it, a progressive and not a stereotyping influence on the curriculum.

The main argument against national agreement on syllabuses is that it limits freedom (*what* freedom is never very clearly stated). At present, it is said, a school can select one of several examining bodies and therefore one of several syllabuses in any subject. But since the school is concerned with about ten subjects, this freedom of choice is unlikely to provide the most suitable syllabus in *each* of them. It is interesting to note that even the ardent advocate of individual freedom generally raises no objection to all the boys in his own class being compelled to follow the same syllabus, take the same tests, use the same textbooks, chosen not by the boys but by himself. If it is proper for all the forms in a single school to conform to the school syllabus, why should different schools dealing with similar boys, drawing their masters from similar sources, not follow a co-ordinated syllabus? After all, the students from schools taking the different examinations go forward to the same universities and the same professional trainings. The task of supplying trained teachers and suitable textbooks increases with the number of unnecessarily different syllabuses.

The war has accelerated changes in our lives which were taking place more slowly in peace time. Many of these changes ought to be reflected in our syllabuses. Let us note a few examples. Air raids have necessitated new methods of first aid; simplified methods of bandaging have been introduced which

will undoubtedly remain after the war. The need for economising material has forced handicraft teachers to instruct their pupils through smaller models; toy-making has become common in schools and has proved most suitable for younger children—a change which might well be maintained after the war. Food rationing has turned attention away from fancy to utility cookery instruction and to problems of saving fuel. The establishment of the Air Training Corps has forced us to reconsider our mathematics and physics courses, and it is no easy matter to decide what should be omitted to make room for new topics. Stocks and shares, profit and loss sums, progressions, geometry theorems, geometrical optics, calculations of specific heats and coefficients of expansion have to compete for a place in the examination syllabus, and hence in the curriculum, with relative velocity, bearings, three-dimensional problems, alternating electric currents, the internal combustion engine, plans and elevations, etc. In biology the classification and morphology of flowering plants and the physiology of fish and reptiles have to compete with fungus pests and food values in an overcrowded syllabus. In English, essay writing has to be compared with other forms of expression as a training in composition. In geography, the claims of map reading and meteorology are pressing, and something may have to be sacrificed to allow more time for them. The history of a whole generation which, in 1938, was considered too recent and controversial for schools, now demands a place in the curriculum.

These changes call for a planning of syllabus which cannot be left to the separate decisions of different universities and different examining bodies. If they are neglected, the examination undoubtedly cramps the teacher; if they are made in a haphazard fashion, they render the teacher's and textbook writer's task impossibly complicated. They can be satisfactorily settled only by a body representative of teachers and those concerned with the subsequent activity of the students.

All examining bodies have now had considerable experience in constructing syllabuses, and the need for this task to be entrusted to a representative conference or committee rather

than to a few individuals is generally accepted. But there is only a limited appreciation of the need for standing committees, that is, committees combining wide representation with a permanent constitution. Many of those who welcome a conference are afraid of a standing committee and even more, afraid of a national standing committee.

I have often heard people, on coming away from a conference called to approve a new examination syllabus, say, 'There, we really have got the ideal syllabus at last'. They have forgotten that each change of syllabus necessarily alters the teaching and creates its own new problems which will have to be met at a later stage, and that there are defects in every new product which show themselves in use. Too often, when an examination syllabus proves defective, the body responsible for it has gone out of existence and cannot be called upon to rectify deficiencies. Instead of syllabuses which are gradually adapted and perfected, we have had a series of fresh syllabuses, each constructed by a different body of enthusiasts. It is desirable for the creators of a syllabus to be in a position to answer criticism and to correct mistakes and deficiencies, because this makes it possible to build up continuous policy. The need for a permanent basis for such bodies follows from the continuous nature of their task.

COMMITTEE WORK. While we are on this subject of committees, let us consider the widely held belief that committees cannot evolve and carry out a consistent policy and that they cannot act with speed and certainty. It is not sufficient merely to assert that this belief is unfounded. We have to show how the idea has arisen and what conditions are necessary for a committee to be an efficient instrument. I have drawn up six conditions for the success of the committees we have in mind. The first two have already been enunciated, namely:

(1) *The membership shall be fully representative of those who will be affected by the committee's decisions; and*

(2) *The committees shall be standing committees with continuity of membership.*

The next three conditions are concerned with the technique of committee work and apply to all committees. Every committee has to be led, and this leadership generally devolves on the chairman and secretary, although in the case of syllabus committees, these officials should, at times, have the assistance of smaller drafting sub-committees, which submit proposals to the full committee. To be effective, a committee, like an individual, must have clearly before it the ends towards which it is working.¹ Successful activity, whether of an individual or a committee, involves a series of decisions to take action which is both practicable in the immediate circumstances and leads in the desired direction. While we are not concerned here with purely individual action, decisions taken by individuals on behalf of others form an important part of committee work—as, for example, when the chairman or secretary acts for his members—and must be considered.² Action has more than an external significance; it reacts on the individual or committee initiating it as well as on those towards whom it is directed. The character of a committee, as of an individual, is formed and modified by taking decisions and acting on them. Committees and individuals learn from the experience provided by their actions.

We can distinguish three ways in which decisions may be taken on behalf of a committee. First, there is the decision taken by the full committee itself after due discussion. Secondly, there is the decision taken by the secretary or chairman on behalf of the committee after careful consideration and consultation. Thirdly, the decisions taken on behalf of the committee by the secretary or chairman without consultation. Each is a necessary part of effective committee work. The full committee's own decisions are doubly significant; they are

¹ We are discussing here only committees whose members have a common object. Bodies on which there are representatives of political parties or others having conflicting interests may constitute a rather different problem.

² Decisions in mental life correspond to actions in the physical world. If decisions are followed by appropriate action, the two words become interchangeable to some extent.

based on wide experience and they contribute to the education of the committee. No one who has had experience of committee work of the kind we are discussing will underestimate the importance of this education of a committee through its own experience. It depends upon the active participation of the members in the decisions and activity of the committee. Committee decisions, however, presuppose time and opportunity for discussion, that is, interchange of opinions, without which they have little value.

A committee delegates its powers to an individual when a decision has to be taken in circumstances which preclude discussion—as, for example, when the committee is not in session. Action taken on behalf of a committee must be such as the committee will approve, and should generally be reported to the committee, not merely for formal approval, but also to enable the committee to profit from the experience which would otherwise affect only the agent. This applies whether the individual is able to consult some of his colleagues, or whether he has to act on the spur of the moment on his own initiative. The relationship between action taken by an individual on behalf of a committee, and action taken by the whole committee is closely parallel to that between instinctive, instantaneous action of an individual, and action following reasoned consideration by him. When a reasonable man acts without time for thought, he draws on his experience which is itself in harmony with his reason, and he examines his action afterwards when he has time to do so. In the same way, the committee confirms and profits from the experience of its agent, who draws in his turn on the wisdom of the committee. While the agent can take decisions which carry out predetermined policy, this policy can be decided only by the committee itself. Such mutual interaction of leaders and members is the essence of successful work; it enables committees to be certain and swift, while still profiting from their wide representative view, just as proper interaction of instinctive or intuitive judgment (i.e. judgment made without time for thought) and reason makes a balanced human being.

Democratic leadership is thus a two-way relationship. It gains its true inspiration and direction from the people whose progress it guides, people who, in their turn, are dependent on its guidance. Both the committee members and its leaders should keep clearly before them the ends for which the committee is working, and should endeavour to combine a relentless forward policy with a refusal to press forward proposals in advance of what is practicable and desirable in the circumstances prevailing at the time. These circumstances include the constitution of the committee itself and the opinions and capabilities of those who will have to carry out the proposed changes.

The members of a committee have to take decisions affecting a wider circle than themselves. Their own attitude becomes modified by their joint deliberations, but those who will have to carry out or will be affected by their decisions lack this experience. Here lies the danger that the committee may take decisions in advance of the requirements of the situation; and steps have to be taken to see that the members are in touch with those whom they represent. Systematic reporting back ensures that they know what their constituents think, and that the constituents have an opportunity of learning from the experience of the members of the committee. As the leading members of the committee are to their colleagues, so are the committee members to their constituents. Unfortunately, systematic reporting back is made difficult by the prejudice that exists to-day in some university and Government circles against the election of representatives. These circles prefer members of committees to be appointed or co-opted by a central body rather than elected by those whose point of view they are supposed to express. It is argued that better and more live committees can be secured in this way. This may be true, but the argument disregards the necessity of allowing the bodies represented, and not merely committee members, to be educated by their joint activities. No group receives a report from an individual member of an outside committee (even though a member of the group) in the same spirit that it

receives a report from its own elected representative on that committee. If such a group is to be educated by the activity of the committee, it must be invited to select its own representatives to serve on the committee. If this ideal is not attainable, the committee should at least do its best to see that co-opted or self-appointed members report back the activities of the committee as effectively as possible. A journal run by the committee could be of great service in this work in explaining policy and in ventilating opinion and criticism.

Syllabus committees should represent three groups, namely, school teachers, university teachers, and professional bodies. Representative teachers could be appointed through their four associations or, in some subjects, perhaps through appropriate subject associations, such as the Science Masters' Association, the Mathematical Association, the Institute of Handicraft Teachers, and so on. The professional bodies are themselves organised bodies; but there are, unfortunately, no organisations which are able to speak for all the universities, and we have to fall back on the Faculties concerned in the separate universities. A committee composed of official representatives of these bodies will move slowly—more slowly than a committee composed of individuals, with the same kind of experience, answerable only to themselves. The task of leadership will be highly skilled, but progress which leads to a real measure of conscious co-operation between the bodies represented will be worth more than the recommendations of an enlightened few—just as a ten-mile advance by the main body of an army may be worth a great deal more than a fifty-mile advance by a small advance guard, which is in danger of being cut off.

Failure in committee work is not due to any innate tendency of committees to be mere 'talking machines' as is sometimes suggested. It results, either from lack of clear leadership, or from an attempt to go ahead of what is practicable. The education of leaders, committee members, and those whom they represent depends upon decisions taken and then transformed into successful action. Decisions to do nothing because of the difficulties of reaching agreement are, in my experience,

generally a reaction against the consequences or fear of over-hasty and therefore impracticable decisions. The appropriate motto for those who sincerely desire progress, and see clearly in which direction it lies, is, 'slow but sure wins the race'. Mutual confidence is strengthened in this way. A representative committee, properly led, has a remarkable sense of the correct pace and direction of reform, a sense that the over-anxious reformer disregards at his peril.

Committees have a way of including a 'left' minority that wants to move too fast, and some include also a 'right' minority that is over-cautious or wants to do nothing. This fearful or reactionary minority feeds upon the mistakes forced upon the committee by the over-hasty 'left' minority, so that it is the chairman's duty to keep before the committee the ends towards which it is working, and to warn members against attempting to take steps in advance of the situation. The prerogative of the leaders is to canalise and express the wishes and policy of the whole body, which may often be the better judge of what can or cannot be done. The surest way of undermining committee work is to have a 'left' chairman, that is, one who is trying to use the committee as a rubber stamp for his own views.

In successful committee work it should not be possible to say who originates the progress made. A friend of mine who was responsible for proposing and working out many details of a new syllabus, which was accepted and put into practice by a committee, remarked afterwards, 'they all think it was their own idea'. That is the hallmark of correct committee work. But it is impossible unless the general direction of advance has been worked out.

We can now state the third, fourth, and fifth conditions for the success of a syllabus committee as follows:

(3) *The committee shall have suitable leadership, and shall insist on close collaboration between the whole committee and the leaders.*

(4) *The committee shall have clearly before it the ends towards which it is working, and shall be on its guard against taking decisions which cannot be effectively carried out.*

(5) *Provision must be made for effective reporting back by the committee members to those whom they represent.*

The sixth condition relates to the power of a committee to put its decisions into effect. This is a big subject, and we will confine ourselves strictly to the syllabus committees under discussion. At present, these committees each serve a single examining body, and the publication of the syllabus automatically brings it into effect. But we are envisaging councils representing several examining bodies, and we have to consider how the decisions of the co-ordinating council are to be enforced on the co-operating parties. I do not think there need be any compulsion, because agreement over syllabuses is to the mutual interest of schools, professional bodies, and universities. For example, Cambridge and London Universities both draw their students from every part of the country and from schools taking any of the eight approved Higher School Certificate examinations. These universities can only hope to plan their first-year courses to follow satisfactorily on Sixth Form work on the basis of co-ordinated Higher School Certificate syllabuses. But this does not mean that the setting up of the proposed co-ordinating councils is likely to be a simple matter. There is no tradition of joint action by the different universities, and there is a certain fear of representative committees.

The work of the Subject Councils will be merely formal unless they fix their attention on the school curriculum and work, rather than on the examination syllabuses to which these are linked by the examination. They should not be content with the mere publication of proposals and ideal syllabuses, but should keep in mind the work actually done in schools as a result of these syllabuses. For example, it is not sufficient that there should be a practical test in science and craft subjects; the important thing is that the work in the schools should be based on the handling of apparatus and materials by the boys and girls themselves.

If there is to be no compulsion, there must clearly be agreement. This implies that the syllabus will not necessarily represent the ideals of any individual or set of individuals,

however gifted; it will rather be that which is able to command the joint approval of a number of co-operating parties, all legitimately concerned with it. If asked what was the ideal mathematics syllabus for the 16-year-old in secondary schools in England, I should reply: that which is evolved over a course of years by a committee representing the secondary schools, the universities, the professions, and commercial and industrial employers of boys and girls leaving secondary schools at 16. There is no other criterion; neither is there any other way of combating the tendency for school curricula to stagnate. Individual idealists sometimes imagine that if they controlled syllabuses, they would be able to 'keep them alive' and up-to-date. But experience shows that these are often the very people who prevent the natural development of subject syllabuses alongside the development of society. Progress, like the growth of a plant, springs from the interaction of conflicting forces, consisting in our case of the interests of the different groups composing the committee. The form of the agreed syllabus will depend on the proportion in which these groups are represented and on the effective working of the committee itself.

The sixth condition for effective working of syllabus committees, and especially for co-ordinating syllabus committees or Subject Councils is therefore:

(6) *The committee should frame its decisions with a view to obtaining the greatest measure of agreement, and on the principle that what is actually known by the students is more important than any paper syllabus.*

HOW ARE SUBJECT COUNCILS TO BE BROUGHT INTO BEING?

I am doubtful whether the time is yet ripe for summoning a fully representative Subject Council in any of the old-established subjects. On the other hand, I believe a Subject Council could be constituted at once in such comparatively new subjects as Domestic Science, where there is little Higher School Certificate work and where the universities are not directly concerned. There are no old jealously guarded traditions to be respected,

and the difficulties of examining in this subject in war time are sufficient to make many of the examining bodies welcome joint action. The same applies to Handicraft and Engineering Drawing, and I doubt whether Geography would present much difficulty. In Music, the ground has been prepared by co-operation between the Oxford and Cambridge Locals and the Associated Board of the Royal Schools of Music. In Art, there is a spirit of enquiry abroad, which might form a favourable background for co-ordinated policy. But in English, Modern Languages, History, Classics, Chemistry, Physics, and Biology, there is difficult ground to be covered, and we may have to be content with exploratory moves for the present. Wherever there is a strong subject Association, such as the Science Masters' Association, this can take a leading part in securing co-ordination, but it should be content to work forward from the existing position, in conjunction with the examining bodies and the four main Teachers' Associations, and should beware of formulating utopian schemes.

The co-ordination of School Certificate subject syllabuses ought not to present great difficulty in any subject, because the bodies which accept a School Certificate credit for exemption purposes seem to be prepared to leave the decision as to what ground is covered by the examination in the hands of the examining bodies, and all that is needed is co-operation between the latter. But, at the Higher School Certificate level, the position is complicated because candidates take the examination not only for its own sake or even for the scholarships that may be awarded on the results, but also to obtain exemption from the Intermediate Examinations (including the First Medical Examinations) of London and other universities. The universities thus have a direct interest in the syllabus and will wish to have a voice in any general decisions that are taken. There is a further complication. Assuming that all the examining bodies and all the universities, which accept the Higher School Certificate for exemption purposes of one kind or another, agree upon a common syllabus in each subject, the schools will still not be free to base their Sixth Form work on

these syllabuses, because they have to consider the needs of students taking the Oxford and Cambridge College Scholarship Examinations, which are still independent of the Higher School Certificate Examinations. Unfortunately, the College Scholarship Examinations require more specialisation in individual subjects than the Higher School Certificate. The latter examination is designed to encourage the student to spread his energies over a group of related subjects, e.g. History, French, Latin, but the Scholarship Examinations may demand concentration on a single subject, for example, History.

A first condition for securing agreement on the best basis for Sixth Form work is a common policy between the College Scholarship and the Higher School Certificate examiners. Some people suggest that the only satisfactory way out of the difficulty is to abolish the College Scholarship Examinations, but this does not appear to me to be a practicable step at present, even if it is desirable. The immediate solution is for the College Scholarship examiners to undertake to keep their tests within the framework of the Higher School Certificate syllabus. In return for this, they should be given a voice in determining the latter.

In the old-established subjects, I advocate joint action or consultation by different examining authorities wherever and whenever possible. An example of such joint action during 1943 to secure agreement on the Higher School Certificate Biology syllabuses may be mentioned. A joint deputation of the Oxford, Cambridge, and Central Welsh Board Higher School Certificate authorities was received by the London University Board of Pre-Medical Studies to discuss conditions under which this subject could be accepted for exemption from First M.B. Later, a conference of representative of those in charge of Biology in the Cambridge Higher School Certificate, the Oxford and Cambridge Joint Board Higher School Certificate, the Cambridge College Scholarship Examinations, and the Science Masters' Association was held to discuss the syllabus for these examinations. This has led to the establishment of a Standing Joint Biology Advisory Committee in

Cambridge. In Physics, a Joint Committee, has been set up by the Physical Society and the Science Masters' Association, and this Committee is exploring the ground for co-ordination. In Mathematics, steps are being taken to call together a committee to consider School Certificate Geometry courses. These partial steps gradually build up the understanding and mutual confidence out of which a representative Council will emerge. But they should be carried on in accordance with the principles we have laid down for successful committee action. An example of failure in these fields is provided by the Conference on Medical Curriculum in 1935, of representatives of the Universities of Oxford, Cambridge, and London, the Royal College of Surgeons, the Royal College of Physicians, and others. A working committee was appointed by the Conference, many meetings were held, witnesses interviewed, and evidence considered; a comprehensive Report was finally issued by the Conference. Unfortunately, this Report was not accepted by the constituent bodies. The members of the Committee were able to appreciate the manifold problems involved, but they seem to have overlooked the need to carry this understanding back to their constituents. They went too far. Not being a permanent body, the Conference went out of existence when its report had been published, and its work was largely wasted. To avoid similar breakdowns, those taking part in the joint consultations advocated here as a preliminary to the establishment of a Council should be content to solve the immediate pressing problems that have brought them together, resisting the temptation to run ahead of what is practicable at the time.

SEPARATE SUBJECTS. It may be argued that the division of the school curriculum into separate subjects is unfortunate, and that the establishment of separate Subject Councils will tend to stabilise this state of affairs. There is general agreement that it is advisable to aim at lowering the barriers between subjects, but this cannot be done without first taking into account the present position. The constitution of Subject Councils should be such as to reflect not only the isolation of the subjects, but

also any tendencies towards uniting them. Let us take as an example the division of science into the compartments Chemistry, Physics, Botany and Zoology.

In the universities, Botany and Zoology are treated separately, each having its own professors and buildings. This separation, like that between Physics and Chemistry, is historical. At Cambridge, the professorships of Botany (1724) and Chemistry (1702) were instituted a century and a half before those of Zoology (1866) and Experimental Physics (1871), probably because of the importance of plants in Pharmacy, and of the hold which Mathematics had over Physics. Fortunately, however, in schools the division of Biology into two separate subjects is purely formal, for Botany and Zoology are taught by the same teachers in the same laboratories. We can therefore advocate a single Subject Council for Biology. On the other hand, the separation between Physics and Chemistry, although not as complete in the schools as at the university, is typified by the existence of separate laboratories and often separate teachers for the two subjects. It would be unrealistic to ignore this by attempting at the present time to set up a joint Council for Physics and Chemistry. The tendencies towards collaboration which are represented by the strength of the Science Masters' Association, the existence and growth of General Science at the School Certificate stage, the fact that many school teachers are qualified in, and teach, both subjects, even in the Sixth Form, the existence of departments of Physical Chemistry in the universities, and the collaboration between physicists and chemists in industry, should be reflected in the membership and policy of the two Subject Councils, and may, in due course, lead to their fusion. But, if we start with an organisation that reflects the present situation, future steps towards collaboration between the two subjects will be soundly based and will actively involve the bodies represented on the Councils, and not merely their representatives.

In the relations between other subjects it is much less easy to see which barriers will become weakened. There is common ground between Modern Languages and Science, but it is less

extensive than that between the individual languages themselves, and that between the individual sciences. The study of modern languages has also many connections with the study of history, geography, and English literature. If one of the ends towards which these Councils will be working is acknowledged to be the reduction of barriers between subjects, schools, universities, professions, and examining bodies will each have their appropriate contributions to make towards this end; and the Subject Councils will provide them with a meeting ground and a starting point.

TEXTBOOKS. Closely allied to the question of subject syllabuses is the question of textbooks. The output of textbooks in many subjects was enormous before the war. Every educational publisher found it necessary to produce one or more books covering each examination in each subject. These naturally overlapped considerably; many of them had some excellent and original features, but none was equally authoritative in all branches of the subject. I am not advocating the issue of standard textbooks, but I think the paper shortage has resulted in a situation where publishers would like to be guided by an authoritative body as to the value of new books. Subject Councils would know what syllabus changes were likely to arise, what conventions and nomenclature were likely to become standard, and so on. If there had been a Mathematics Council to vet textbooks on Aircraft Mathematics, many an R.A.F. man's shillings would have been saved. The Subject Council could place its stamp of approval on those books that came up to the required standard, and this in itself would raise the standard and reduce the duplication of textbooks. A more important step would be to encourage co-operation between teachers in the production of authoritative textbooks, for the present cut-throat competition places too great a premium on originality. It is unsatisfactory that teachers, students and the public should be dependent on single individuals, however able, for the presentation of established subjects, especially when their books may include individual theories about the

subject without any indication that these are merely personal. We want to be able to buy the collective wisdom of the teachers in a single volume, and Subject Councils can help to make this possible, without discouraging the publication of original contributions. Such periodicals as the *School Science Review* and the *Mathematical Gazette* can do much to supplement textbooks, and each Council should have some periodical at its disposal as a means of expounding its policy and as a forum for discussion.

CHAPTER VII

REGIONAL JOINT EXAMINATIONS

IN the last chapter we considered means of transferring the control of subject syllabuses from the examining bodies to National Subject Councils in order to secure a general co-ordination of school curricula throughout the country and continuity of work between schools and universities. Does this proposal mean that we advocate complete centralisation of the examination system? No, the reverse is true. When machinery for democratic central control of syllabus has been developed, we shall be free to work out a regional organisation of the examinations adapted to local needs.¹ Side by side with the development of Subject Councils, I advocate a twofold change in the organisation of the present examinations, namely:

(1) Schools and universities to be grouped on a regional basis, so that (a) each examining body examines only the schools in a geographical region surrounding its own university or universities, and (b) all schools in this region take the same examination. In devising the regions the aim should be for each examining body to have a share of eight to twelve thousand of the present seventy thousand candidates.

(2) The constitution of each examining body to be on the basis of one-quarter to one-third representatives of the university or universities included in the region; one-third to one-half representatives of the teachers in the schools examined; one-quarter to one-third representatives of the Local Education Authorities in the region, and one or two H.M. Inspectors.

We shall see that these two reforms cannot be considered separately.

¹ I have used the word Region for the geographical area served by an examining body because I have not been able to find a better word. I would ask the reader not to be influenced by other associations connected with it, e.g. in Local Government. I wish also to stress that my proposals carry no suggestion for limiting the area from which a given university draws its students.

One of the most widespread criticisms of the present school examinations is that they exert a cramping influence on the teachers, who are prevented by them from teaching what they would otherwise teach. This amounts to an accusation that the examinations consist of pieces of work which the teachers would normally consider unimportant, and that such work acquires a false importance because of the examinations. If this is the actual state of affairs—and no one will deny that the criticism has some foundation—would it not be better, one may ask, for the teachers to conduct the examinations themselves? They would then make sure that the examination was merely a continuation of the ordinary school work. One suggestion that has been canvassed a good deal is for each school to have its own examination, conducted by its own teachers. Such examinations would, however, be *internal*, and would consequently not provide a means of fixing common standards in the different schools. The examination system would consequently lose all its co-ordinating power and cease to act as a guide and stimulus to teachers. Some people may think that this would be no loss; that teachers, being responsible people, need no external stimulus. But I believe that those who take this view, whether teachers or parents, are in a small minority. Parents are not prepared to leave it to the whim of the individual teacher to decide what their children learn at school. All good teachers wish to devote time to those aspects of the subject about which they know most, but the majority admit, on being pressed, that important sides of the work would be neglected if it were not for the stimulus of an examination.

The substitution of internal for external examinations would also put an end to the possibility of selecting boys and girls from different schools for future employment or future education by direct and fair competition. This would be bad for the nation as a whole and unfair to the individual children. Headmasters would find that their boys' chances of getting jobs or scholarships depended on their recommendations, and children from small schools would often be at a disadvantage. These difficulties would be overcome if the examinations, although

run by the teachers themselves, were arranged jointly so that several schools took the same examination. As we have seen, such examinations would be external examinations with all their stimulating and co-ordinating effects and their power of ensuring equality of opportunity. If properly conducted, they would also avoid any cramping effects, except in so far as they compelled the individual teacher to conform to standards of teaching and syllabus laid down by the collective wisdom of his colleagues.

There is, however, one serious disadvantage of joint examinations run entirely by the class teachers responsible for the candidates. This is expressed in the principle stated and discussed in Chapter III that an examination should be run jointly by those responsible for teaching the candidates and those responsible for their future activity or education. The best plan thus appears to be a system of external examinations run jointly by representative teachers of the classes to be examined, assisted by representatives of those who will be responsible for the subsequent education of the successful candidates. We shall now consider in what way the present examinations fall short of this ideal.

We have seen that the majority of School Certificate examiners are school teachers. But they are not in any sense the representatives of those teaching the candidates. They are merely appointed by the examining body from those who happen to apply for the work, and it has generally been a condition of appointment that a man or woman shall not be teaching in a school presenting candidates for the particular examination on which he or she is employed. The school teacher examiners are answerable only to the examining body, and not to their colleagues. Thus, while we have achieved a notable advance since the old days when the examiners were exclusively 'university', it has come about that each appointment is a purely personal, and, one might almost say, a non-professional matter. At any gathering of school teachers, there will be present a number who have experience as School Certificate examiners, but none who has any responsibility to

his colleagues for his actions when examining. In fact, the school teacher-examiners tend to be a small circle of hard-working, or hard-up, men who add substantially to their incomes by examining, often for more than one of the examining bodies.

GROUPING OF SCHOOLS. It is often claimed that there is a positive advantage in the freedom of schools to choose their examining bodies, and undoubtedly, until other reforms are made, this is a valuable safeguard. Competition between the examining bodies has certainly played a part in maintaining their efficiency; but the consequent haphazard distribution of the schools taking any given examination is one of the main obstacles to the further development of school control. We have to face the contradiction that, if examinations are to be taken jointly by a number of schools, and are yet to be largely under the joint control of those schools, the schools must be grouped geographically. I cannot see any advantage in perpetuating a system of random grouping even if it were genuinely random. Actually, the position to-day is that London University examines the bulk of the London schools; the Northern Universities Joint Matriculation Board has grown to such an extent that it has now a virtual monopoly in the North and Midlands; the Oxford and Cambridge Joint Board deals almost exclusively with the public schools, and only the remaining schools in England are divided between Oxford, Cambridge, and London in a random way.¹

The natural grouping of the London and Northern schools has brought its own advantages on the administrative side, but the arrangement by which the public schools have their own Higher School Certificate and School Certificate examinations has little to commend it. Examinations run jointly from two universities which are notoriously inaccessible to each other

¹ This leaves the Durham and Bristol Boards out of account. They have been able to provide the small number of schools which take their examinations with many of the advantages of regional joint examinations.

are necessarily difficult to administer. More serious, however, is the influence of the Oxford and Cambridge Joint Board in maintaining the isolation of the public schools at a time when everyone is agreed that they should be brought more closely into touch with the rest. It would be foolish to pretend that the Joint Board is the only bond holding the public schools together as a group apart, but, on the academic side, it is one of the main factors, and its importance in this respect seems to have been widely overlooked. The present isolation of the public schools is equally bad for them and for the other schools. It means that many of the best qualified teachers are taken out of the main educational system, and that excellent laboratories and other material appurtenances of education fail to do full duty. The public schools themselves are beginning to realise that the education they offer is limited by this isolation. If all schools in the same town took the same examinations, we should have the basis for closer collaboration between them.

However, it would be unsound to advocate grouping of schools under a regional examining body, with the consequent removal of freedom of choice, unless the restriction were accompanied by a fuller measure of control by the schools over the examinations which they were bound to take. At the present time the examining bodies are under university control. It is true that they include school teachers and local education officers among their members, but the method of appointment of many of these members makes them representative of no one but themselves, so that the schools taking the examinations, and the Local Education Committees most concerned, possess no effective measure of control.

The school teacher members of examining bodies, who are, in the main, headmasters or headmistresses of schools taking the examinations, have proved to be invaluable. They bring an intimate knowledge of the problems, born of experience, and they take away with them a greater understanding of examination work. But their presence has not proved to be sufficient to draw the schools into partnership. This is shown by the surprise at the care and efficient machinery employed

which is often expressed by teachers when they first become associated with the examinations. The school 'representatives' are co-opted by the examining body, not elected by their colleagues, and are thus in the same position as school teacher examiners. Acting in an individual capacity, they are free to express their own opinions irrespective of whether these would be endorsed by their colleagues or not.

The problems which confront syllabus committees are, as we showed in the last chapter, of such a nature that the teacher representatives on them should be appointed by their national organisations. But I consider that the teacher representatives on an examining body should be appointed directly by the schools taking its examinations. This is, unfortunately, not practicable until a more rational system of grouping has been adopted. Co-option by the examining body, or appointment by national teachers' associations, seem to be the only methods of appointment at present available. In either case, every effort should be made to secure people who will best represent the schools taking the examinations, and use might be made even now of the local branches of the Secondary Teachers' Associations. When school representatives on examining bodies are directly responsible to the schools taking the examinations, and when these schools are so grouped that the election and reporting back of representatives can be arranged without difficulty, we shall be nearer the ideal of examinations controlled by the schools taking them.

The local education officers on examining bodies are either appointed by their Associations or chosen by the examining bodies from nominations made by these Associations.¹ The representatives on the Cambridge Syndicate are (in 1943), the Education Officer of the City of Birmingham, and the Directors of Education for Staffordshire and the Lindsey Part of Lincolnshire. No single school under the Birmingham Authority takes the Cambridge School Certificate Examination, and it

¹ I am speaking from experience of the Cambridge examinations. The position may be different with some other Boards, if not in kind, at least in degree.

is taken by only three of the Staffordshire schools. The Education Officer for Birmingham finds it virtually impossible during war time to attend meetings in Cambridge, and the Director of Education for Staffordshire attends only at great personal inconvenience. The Lindsey schools, on the other hand, all take the Cambridge Higher School Certificate Examination, and the majority of them take the Cambridge School Certificate as well.

If all the local education officers on an examining body were appointed by the authorities whose schools take the examinations, we should have machinery for bringing universities and education committees into more direct relationship on work which is the vital concern of each, namely, scholarship awards.

OBSTACLES TO REGIONAL ORGANISATION. If regional organisation of examining bodies is the proper next step in developing the examination system, what is preventing its adoption? I have discussed the proposals in this chapter with many teachers and have found three main doubts expressed. First, whether it is advisable to create monopolies. Secondly, whether it is wise to give up the guarantee of impartiality which is thought to be furnished by the independence of the universities. Thirdly, whether, in any case, the universities will agree to surrender ultimate control.

Let us consider these points separately. As regards monopolies, the era in which free competition was the main guarantee of freedom has passed, and we are now faced with the problem of devising new safeguards. When I suggested to an experienced Chairman of a County Education Committee that the only solution to the difficulty of arranging visits of examiners to schools was a regional basis for examinations, he replied: 'You are right; that is the logical conclusion; but as long as schools are free agents they will use their freedom, and once again we are up against the modern clash between freedom and planning.' How is this contradiction to be resolved? I think only when the agents to whom power is delegated are controlled collectively by those most affected by their activities.

Our attitude to the undoubted growth of monopolies should not be the negative wish to go back to the good old days of free competition (essential in its day), but the constructive determination to work out more efficient methods of democratic control. I should like to see the old cry, 'no taxation without representation', modernised in the form, 'no compulsion without a share of control'. Popular education on these lines seems to be a necessary preliminary to solving the apparent contradiction between freedom and planning in many spheres of modern life, including education.

This leads us to the second doubt expressed, namely, whether we can find a substitute in the examination field for the impartial independence of the universities. If a body, composed as I have suggested, of university, school, and Local Education Authority representatives cannot be trusted to be impartial, one may be excused for asking whom it would be likely to favour. I think a fear of Government, or Local Government, control lies at the back of the attitude we are considering, and the universities are thought to be powerful enough to make a stand, if necessary, against Central or Local Government. In so far as this attitude represents an attempt to use the universities to block progressive steps, we can ignore it, because it will command little support. In so far as it is based on fear of a reactionary or ill-informed Board of Education or Education Committee, it is not realistic, because the universities are unlikely to be better informed or more enlightened than the Government or the Local Education Authorities where schools are concerned. But there remains always the danger of bureaucratic control, that is control by officials rather than the bodies they represent, and I think the universities can play their part in preventing this, but only by joint action through the Secondary School Examinations Council or some other representative body.

We have also to take into account the mutual distrust between various parts of the system. Independent schools distrust Local Education Authorities, fear the Board of Education, and put their trust in the universities. Maintained schools

dislike non-maintained schools; Local Education Authorities resent university interference in school affairs; the universities show little desire to co-operate with each other, and therefore have no effective machinery for the purpose; and the Board of Education does little to resolve the tangle.

I do not believe the universities would resist a demand for them to relinquish ultimate control of the examining bodies, provided that such a demand was widespread. At present, for the reasons stated, it is only half-hearted. Perhaps mutual confidence between the different parts of the educational system will grow when universities and schools, teachers, and the public realise that their narrow sectional outlook and failure to move with the times is playing into the hands of those who advocate bureaucratic control through a reactionary philosophy masquerading in honeyed phrases. Belief in democracy becomes real for most people, including teachers, only through experience of working it.

It is already being suggested, not only that the examination system should be swept away, but that the whole basis of secondary and university education is wrong. For example, Sir Richard Livingstone devotes a chapter of his recent book to denouncing examinations at school and university.¹ In this book (in which he quotes both Hitler and Mussolini, apparently with approval) he assumes that 'character training', which he takes to be the real aim of education, can be separated from the technical, scientific, and linguistic work which occupies so much of the educators' time. And yet, to the extent that the battle of Waterloo was won on the playing fields of Eton, the present war is surely being won in our secondary and technical schools. Sir Richard Livingstone seems to have realised that his barren doctrine is opposed to modern educational theory, for he devotes a portion of his book to an attack on Professor John Dewey's writings. It is not surprising that Dewey should have been selected for this attack, because his works provide the philosophical basis for what seem to me

¹ *Education for a World Adrift*, by Sir Richard Livingstone, Cambridge University Press, 1943. See pp. 157, 158; 8; 129-31.

to be the best trends in present-day education. Although Dewey does not show any enthusiasm for examinations, nevertheless we can infer much about the way in which they need to be changed from the penetrating analysis of false tendencies in education in his book, *Democracy and Education*.¹ The following two extracts indicate his position:

...there can be no doubt that a peculiar artificiality attaches to much of what is learned in schools. It can hardly be said that many students consciously think of the subject matter as unreal; but it assuredly does not possess for them the kind of reality which the subject matter of their vital experiences possesses. They learn not to expect that sort of reality of it; they become habituated to treating it as having reality for the purposes of recitations, lessons, and examinations. That it should remain inert for the experiences of daily life is more or less a matter of course. The bad effects are twofold. Ordinary experience does not receive the enrichment which it should; it is not fertilized by school learning. And the attitudes which spring from getting used to and accepting half-understood and ill-digested material weaken vigor and efficiency of thought.

If we have dwelt especially on the negative side, it is for the sake of suggesting positive measures adapted to the effectual development of thought. Where schools are equipped with laboratories, shops, and gardens, where dramatizations, plays and games are freely used, opportunities exist for reproducing situations of life, and for acquiring and applying information and ideas in the carrying forward of progressive experiences. Ideas are not segregated, they do not form an isolated island. They animate and enrich the ordinary course of life. Information is vitalized by its function; by the place it occupies in direction of action [at p. 190].

School conditions favorable to this division of mind between avowed, public, and socially responsible undertakings, and private, ill-regulated, and suppressed indulgences of thought are not hard to find. What is sometimes called 'stern discipline', i.e., external coercive pressure, has this tendency. Motivation through rewards extraneous to the thing to be done has a like effect. Everything that makes schooling merely preparatory works in this direction. Ends being beyond the pupil's present grasp, other agencies have to be found to procure immediate attention to assigned tasks. Some responses are secured, but desires and affections not enlisted must find other outlets.

¹ *Democracy and Education*, by Professor John Dewey, The Macmillan Company, New York, 1930.

Not less serious is exaggerated emphasis upon drill exercises designed to produce skill in action, independent of any engagement of thought—exercises having no purpose but the production of automatic skill. Nature abhors a mental vacuum. What do teachers imagine is happening to thought and emotion when the latter get no outlet in the things of immediate activity? Were they merely kept in temporary abeyance, or even only calloused, it would not be a matter of so much moment. But they are not abolished; they are not suspended; they are not suppressed—save with reference to the task in question. They follow their own chaotic and undisciplined course. What is native, spontaneous, and vital in mental reaction goes unused and untested, and the habits formed are such that these qualities become less and less available for public and avowed ends [at p. 209].

Three points from these passages should be noted: (1) the tendency for school work to be academic in the sense of being unrelated to problems met with in ordinary life; (2) the fact that, by suitable methods, including provision of practical equipment of one kind or another, schools can overcome this tendency; and (3) the danger of augmenting this unreality of school education by substituting artificial stimuli to interest for the natural interest of an activity which is a step in an ultimate aim.

If examinations are to play a progressive role in education, they have to be so planned and controlled that they encourage those tendencies in teaching which bring the boys and girls to use their intellectual powers in situations, and on subject-matter, related to real problems. Further, what we have said about the function of an examination as an intermediate goal in the series of steps by which the student struggles towards proficiency and real knowledge must be considered in relation to the danger which Dewey emphasises that an intermediate goal, an extraneous stimulus, may divert the student's energies from real education into false intellectualised education. It must be noted, however, that one of the main conditions for satisfactory education according to the principles laid down by Dewey is that school work shall lead directly to further activity. This is far from the case at the present time, and for two reasons. First, because much of what is learnt in school and

included in examinations is of little value in later life; secondly, because there is insufficient guarantee that any employment, let alone suitable employment, will be available for the boy or girl after leaving school. The second reason is, unfortunately, outside the control of educationists, but not the first. We have indicated in the last chapter how national control of syllabuses can ensure that the subject-matter of the school course is that most suitable for later life, but this is only part of the problem. Not only the subject-matter, but also the way in which it is tackled by the children must concern us. 'Where schools are equipped with laboratories, shops and gardens, where dramatisations, plays and games are freely used', education can be more closely related to life outside the school. But wherever the competitive stimulus of examinations is used, it will lead to emphasis on those activities which will form part of the examinations. If we want laboratories, dramatisations and games to provide the groundwork of education, these things must be utilised in the examinations. I believe this can be done quite effectively *provided the schools are grouped together geographically.*

I give below two extracts from the press that happen to have caught my eye while planning this chapter. The first is from an article in *The Times Educational Supplement* of May 15, 1943, by Beatrice King on the use of school children for harvest work in the U.S.S.R.:

On the whole the campaign of 1942 was a success. In many districts schools began their help even before the sowing started. They collected manure, repaired farm buildings and equipment, sorted seed and carried out a number of other tasks...Not everywhere, however, was the preparatory work well done. In a number of schools it was found that the agricultural teaching was only verbal: a lesson on a tractor being illustrated on the blackboard, without any actual handling of a tractor taking place, whereas the whole point of this preparation was so to train the pupils that their work in the field was immediately productive.

The second extract is from a news item in the *London Evening Standard* of June 5, 1943. After indicating the realistic nature

of some of the new infantry battle schools for night fighting, it states:

Reports from Tunisia have emphasised the value of the realistic training in battle schools. A number of these schools were established there behind the front line, and troops sent there for special intensive courses distinguished themselves greatly when they went into action.

Much of our education is of the 'blackboard type', and often for the simple reason that the examinations consist mainly of written work. Little wonder that some people say in desperation, 'abolish examinations'. If examinations are to take their place in true education, they need to be made more practical, and this does not apply only to the subjects that have come to be called 'practical'. Every subject of the curriculum has its practical side which could be developed provided the examinations were modified in the right directions.

CHAPTER VIII

LESS ACADEMIC SUBJECTS

IN this chapter we shall consider the various ways in which even the present examinations encourage children to apply their theoretical knowledge to practical problems. We shall also indicate the direction in which examinations should be developed to strengthen this aspect of school work. We will start with those subjects of the school curriculum in which practical application can be secured without other apparatus than pen and paper, and finish with those in which the whole basis of the work is practical, and writing appears to be superfluous.

ENGLISH LANGUAGE. The first subject for consideration is English Language, since it supplies the bases of education for English-speaking peoples. The usual forms of an English Language examination are the essay (or some other kind of original composition), the *précis* (and other comprehension tests), grammatical exercises, and dictation. Sir Philip Hartog has summed up the shortcomings of school essay writing in the phrase, 'Write anything about something for anybody'. In his article under this title he points out that every piece of writing in real life involves at least two persons, the writer and the person addressed.¹ It follows that both the thing to be communicated and the nature of the audience should determine the form of presentation. This statement goes to the heart of the matter; it reminds us that language is an instrument to be used in the affairs of life. We can recognise four processes in the practical utilisation of language, namely, (1) thought by an individual about activity; (2) translation of this thought into speech or writing; (3) comprehension of the resulting language by another individual, i.e. its translation back into thought; (4) the relating of this thought to activity. Language examina-

¹ International Institute Examinations Enquiry, *Essays on Examinations*, Macmillan, 1936, p. 135.

tions are apt to neglect the first and last links in this chain. The essay is in danger of isolating the second link, and encouraging the false idea of 'good English' as an end in itself. The précis is concerned with the third and second links in that order, and its shortened statement has little value unless produced for a specific purpose. However, English Language examinations have been much improved in recent years, and acknowledgment should be made to Sir Philip Hartog and his Committee and to the Civil Service Commission. Reference should be made in particular to a thorough treatment of the whole subject in *The Marking of English Essays*,¹ published during the war.

Some school teachers dislike English Language being considered a separate subject, rightly emphasising that every subject of the curriculum should play its part in developing the ability to understand and express oneself in speech or writing. The Board of Education have often urged the examining bodies to make more use of the written work sent up in History, Geography, and Science to supplement special language tests in assessing the student's power to write. This plan has much to commend it, especially when it is remembered that the children will take more trouble to express themselves clearly and grammatically in all their work in these subjects if they know that notice will be taken of their English in the examination. The writing in these subjects is done under more normal conditions than in a special language test which often produces stilted, self-conscious work. The fact that the plan has not been more widely adopted is due to technical difficulties which could be overcome.

However, in spite of what has just been said, the position of the subject English Language in the School Certificate Examination has recently been strengthened because of the widespread conviction that the standard of English writing is below what it should be. I have gained the impression that comparatively few teachers are qualified to approach this subject with the confidence necessary for success, and that a

¹ International Institute Examinations Enquiry, Macmillan, 1941.

campaign to train existing, as well as new teachers will be necessary if there is to be a change in the present position. Regional joint examinations would supply the machinery for this campaign.

1. In what ways would 'Regional Examining Bodies' be able to improve the examinations in English Language? I think in three directions. First, they could make co-operation between teachers and examiners more real. For example, I should like to see the principle recognised in this, as in all other subjects, that every competent teacher serves in turn as an assistant examiner. Many school teachers have told me that they have learnt much about their own job from acting as examiners. One man put it as follows: 'When I came to mark the work of other schools, I found that candidate after candidate was making certain mistakes which the examiners had agreed should be penalised. I asked myself whether my own boys were not making the same kind of mistakes, and next term I found that they were. In that way my own teaching improved as a result of my examining experience.' Similarly, teachers get ideas for their own work through seeing the good work sent up from other schools. A teacher can learn much from assisting in an examination which is not taken by his own pupils, but there are greater possibilities in an arrangement which allows a teacher to examine the work of other schools on the papers for which he has himself been preparing students. If every teacher knew that he would take his turn in marking the work, a sense of joint responsibility would grow, and the examination would cease to be a game in which teachers and examiners were on opposite sides. Time for examining should be allowed off from teaching, so that the task of assessing scripts would be done during the ordinary working day and not late at night or at week-ends.

Secondly, with schools grouped geographically, regular meetings of all the English teachers with the examiners could be held after the examination results had been issued. At these meetings there could be a frank discussion of the tests which had just been held, so that examiners would hear the reactions

of the teachers, and the teachers would hear the examiners' criticisms of the work. The meetings would form the culmination of one year's work, and would lay down plans for the following year. Since the business conducted would not be confined to the examination, this would come to be thought of as one of many aspects of the work and not something external; an aid to teaching as well as a means of classifying students.

Thirdly, various tests of spoken English could be included in the examination. These cannot be organised satisfactorily unless examiners are sent to the schools or the children from several schools are collected together, and both arrangements are impracticable without a regional grouping of schools. The tests could be on the same lines as the present oral examinations in modern languages, but precautions would have to be taken to see that the standards of pronunciation expected were understood by all the teachers and agreed to by them. Naturally, it would be necessary to guard against the introduction from outside of arbitrary standards, say on B.B.C. lines. I believe that valuable developments in the cultivation of spoken English could be attained by introducing quite new ideas into the examinations, borrowed from Eisteddfods and drama competitions. These are better discussed under the heading English Literature, where they probably play their greatest part.

MATHEMATICS follows naturally after English Language because these two subjects are the servants of the other subjects of the curriculum. They both deal with the expression of ideas by symbols; their principles are essentially for application. The ground to be covered in English Language and Mathematics should change as the curriculum develops and its content alters, so that the appropriate methods of expression, logical statement, and calculation may be applied to the new problems.

I think Mathematics is essentially a written subject. The improvements needed in examinations are concerned with syllabus rather than methods of teaching. Mathematics teachers have tended to develop their subject as an end in itself

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rather than as a means of teaching children to apply universal methods to every subject. If we want to see more teaching of English Language as a specific skill, we want Mathematics to adapt itself more consciously to the demands of the rest of the curriculum. This process could be encouraged by a National Subject Council, but a regional organisation of schools and universities intimately concerned with their own examinations could play its part by keeping the subjects alive.

Perhaps the most controversial section of the subject is Geometry. As we have already noted, the School Certificate syllabus has become stereotyped, and there is a danger that, in the hands of any but the best teachers, it may be treated in an authoritarian spirit. Two points should be kept in mind in revising this syllabus. The first, which has received increasing recognition lately, is that the axioms or starting-points of the subject are based on experiment. The statement that the three angles of a triangle together make two right angles and other equivalent axioms are statements of facts that children can discover for themselves with pencil, paper, ruler, and scissors. The subject gives children practice in using mental processes to supplement practical methods of appreciating the connection between different geometrical facts, each of which can be verified practically. The second point which is often not sufficiently stressed is that logic is concerned only with the formulation and presentation in language of our conceptions of the facts and processes of nature. It has little to do with their discovery, except in so far as this is helped by clear formulation. The importance of simple geometrical riders is that they give children practice in discovering truths and not merely in expounding them. The Mathematical Association has done much through its *Report on the Teaching of Geometry*, and through discussions, to widen the scope of the subject. We now need to see the application of the methods of logical exposition applied by the mathematics teacher to other subject-matter than geometrical figures and numbers. Children should practice writing out logical statements of the connections between some chemical, physical, biological, geographical, and historical

facts as well as between the properties of the triangle and the circle. They would thus have an opportunity of grasping the limitations as well as the advantages of the logical method in human life and thought.

ENGLISH LITERATURE. No subject has caused so much discussion in relation to examinations as this. The literature teacher tries to put his pupils in the way of appreciating good literature throughout their lives, and competitions—for examinations are competitions—may seem to be out of place in dealing with so ill-defined a matter as appreciation. One can arrange students in an order according to the merits of their own writings, but it is undesirable to attempt to place them in order according to their appreciation of other people's work, because this leads in practice to the mere recapitulation of secondhand opinions, and so may defeat its own purpose and discourage genuine appreciation. Yet appreciation is born of knowledge and understanding, which can both be tested. Literature examinations have to avoid requiring either an over-detailed study of a single book or a mere smattering of second-hand knowledge of many books. I shall not attempt to discuss the merits of different types of test and syllabus, but I think experiment might be made with examinations in which the students are allowed access to the book they have been studying, thus reducing the importance of memory work. These are matters that should be considered in concrete form by the teachers and examiners at the kind of meeting we have advocated above. Provided such meetings accepted the principle that the examination was an adjunct of teaching as well as a means of testing the students, and provided decisions were reached as to the basis on which the order of merit of the candidates was to be determined on each type of test, there is little doubt that joint examinations of one kind or another would be retained in English Literature.

A system of regional examinations would make possible two other improvements. First, the inclusion of *viva voce* tests, done in class, and given by the teacher in the presence of or with the

aid of the examiner. Such tests could be used in many subjects, but they seem to me to be especially appropriate in Literature. They could be on a prepared subject or unseen, and they might be given in joint session to the candidates from several schools. Secondly, the introduction of collective competitions for which the whole form enters as a unit. It is inadvisable to attempt to forecast the exact manner in which such competitions would be organised. They would be perfected by practice, and would make use of the experience already available from musical festivals, drama competitions, inter-school and inter-house sports events, A.R.P. quizzes, etc. The production of plays, debates, elocution contests, could all have their part. The principle might be that marks were awarded as the result of competition on the basis of accepted rules, and that every member of the form—or it might be of the school—received the same mark. The brilliant boy would get low marks if his school did badly, and the dull boy high marks if it did well. These marks would be added to the individual marks for the rest of the examination in a proportion to be determined—possibly quite a small proportion. This part of the 'examination' would become a festival in which all the schools in a neighbourhood would participate.

HISTORY. This is a subject that has always been in danger of being cut off from ordinary life. Its points of contact with the real world are in the study of records and archaeology, and in present-day social movements, industrial organisation, forms of government, and current politics. Purely written examinations of the conventional type certainly do not encourage the student to gain first-hand acquaintance with these things, so that there is a danger of his accepting interpretations of past events at second-hand without learning to check their correctness from his own experience. They seem to me also to be open to abuse when the political opinions of teacher and examiner differ. One suggestion that has been made, and I believe tried out in some schools, is an examination in which the candidates are allowed reference to books or documents. The 'project

method' of teaching also seems to have much to recommend it in History, especially in relation to 'civics', and the possibility of allowing a boy or girl to present work done during the year for the examination should not be lost sight of. The annual meeting of teachers and examiners that we have envisaged, would be well suited to work out new methods, because it would be able to watch their effects at first hand and propose modifications after trial.

GEOGRAPHY. Examination papers in this subject have been much improved recently by including work with ordnance survey maps and by encouraging the study of local geography. These sides of the subject could be further developed in relation to the examination if all the children taking any one examination lived in the same district.

MODERN LANGUAGES. Even under the difficult conditions of the present haphazard distribution of schools, examining bodies send examiners to the schools to conduct 'oral tests'. These tests are not compulsory, but everyone agrees that they ought to be. If the time at present spent by oral examiners in travelling from town to town to seek out the schools taking their own particular examination were available for actual examining, thousands more children could be included in the time available without additional labour. The Northern Universities have worked out a scheme of compulsory reading and dictation tests, which are conducted by the candidates' own teacher checked by a visiting assessor. The assessor merely decides whether the general standard of the marking at the various schools agrees with the average. The scheme would be difficult to work in an examination where the schools were more scattered than they are in the case of this Board.

SCIENCE stands midway between such subjects as Mathematics and English Language, for which written examinations are suitable, and such subjects as Cookery and Art, which deal

with the expression of ideas in other media than writing, and in which the only possible examinations are 'practical'.

The word 'science' is at present used in schools and universities to denote the understanding of the processes of the world in which we live, including our own bodies, and embracing the man-made apparatus and devices of engineering which have resulted from years of applied science. It is the study by man of the external world for the purpose of gaining mastery over it. It involves the formulation and manipulation of concepts, theories, and principles, which help the student to form, within his mental world, an accurate picture of the external world. These mental images are valueless unless they correspond to the external world, and they are of no use to an individual who has *learned* them unless he has grasped their connections with the external world.

Thus science lessons, although entirely concerned with external things, involve complicated theories that have to be understood mentally and expressed in writing.¹ This fact makes it necessary to maintain a balance between written work and practical manipulation, observation, and experiment in the conduct of the lessons, and, therefore, also in the examinations. There was more than an element of truth in the doctrine of the heuristic school of science teaching that a student only learns what he discovers for himself by experiment. It is obviously impossible to test by experiment and observation everything that we learn, but we should certainly try to test as much as possible, so that imagination has a sure foundation for dealing with the remainder. Hence, the science teacher tries to inculcate in his students the habit of never being fully satisfied until their knowledge of a matter has been tested and enriched by experience. Every genuine science teacher is alive to the danger of his subject becoming a mere book subject; for

¹ Psychology and Social Science are excluded by the statement that science is entirely concerned with external things, for in these subjects the investigator cannot always pretend to stand entirely outside his observations. Neither of these subjects at present comes within the term 'science' as used in schools.

its range is now so immense that much of it has to be learnt from books instead of from experiment and practice. He knows that the teaching of science will not yield the 'results' that have come to be expected of it unless it is based on first-hand familiarity with physical, chemical, and biological phenomena.

PRACTICAL EXAMINATIONS. Laboratory tests formed an important part of the earliest school examinations in Chemistry (see Appendix II), but external school examinations have suffered because it has not been possible to arrange for the examiner to be present during the test, and the candidates have made written accounts or drawings of what they have done. This has had the effect, unfortunately, of forcing the examiner to devise tests that lead to results that can be expressed on paper. Candidates have been aware that they will be judged, not by what they do, but by what they write about what they have done. Teachers found it necessary, especially in Chemistry, to develop a practical branch of the subject, which became an end in itself instead of being a handmaid to the theoretical work. A form of quantitative and qualitative analysis that might be described as 'school examination practical chemistry' was developed. This led some years ago to a campaign by the teachers for the abolition of practical examinations. I well remember one public school physics master, who took part in this campaign, boasting that he used to advise his boys to begin their practical examination by writing an account of the experiment, and to perform the experiment at the end, if they had time! As a result of this campaign, the principle has now been accepted that a practical examination is not fully satisfactory unless the examiner conducts it in person. Many examining bodies have consequently given up practical science examinations at the School Certificate stage and require instead a statement, signed by the teacher, that each student has carried out a proper course in the laboratory. In the Cambridge School Certificate practical examination in Physics the candidates are forbidden to write a description of what they do, being marked entirely on the results of their experiments.

Another plan is to set a special written test, which, it is claimed, can only be answered by candidates who have worked in a laboratory. It is doubtful whether any of these plans are entirely satisfactory. So long as written work is tested by written examinations, and practical work is exempt from direct examination, there will be a premium on written work which is divorced from practical application. In the London Higher School Certificate Examination the difficulty is surmounted by requiring all the Science candidates to attend at the university for the practical examination, while the Oxford and Cambridge Joint Board (and, I believe, some other bodies) send examiners to all schools taking Physics in the Higher School Certificate Examination. The London system has broken down under the conditions of this war, and always had the disadvantage that the candidates were working in a strange laboratory. The Joint Board have also had difficulty in maintaining their plan during the war owing to the scattered distribution of the schools, but their system is universally praised by schools and examiners.

Another difficulty met in the organisation of practical examinations in Science at the present time is in the provision of apparatus. A satisfactory examination conducted in the absence of the examiner requires some uniformity of apparatus. If the examiners ask for each candidate to have the use of certain apparatus, this may force schools to buy specially for the examination apparatus which differs only slightly from that normally used in the school. At one time, the practical examinations formed an excuse for science teachers to demand certain apparatus from the school authorities. But since the war, some apparatus has been difficult to get and the provision of particular instruments may be impossible. The examiners cannot know what is in stock at each school, and hardship may result. For example, in July 1943, 500 c.c. flasks and 50 c.c. pipettes were required for the Cambridge Higher School Certificate Practical Chemistry, whereas it was found that some schools habitually used, and only stocked, 25 c.c. pipettes and 1000 c.c. flasks. Again, since the war, apparatus supplied to schools has sometimes been defective, so that candidates may

have been penalised through no fault of their own. Much labour and organisation is also required to collect and despatch uniform biological material to all schools, and there is always the fear that it will arrive in bad condition.

All these factors tend to produce a general, vaguely felt, hostility to practical examinations. This expresses itself at present in the form: practical examinations are unnecessary at the School Certificate stage and are unsatisfactory at the Higher School Certificate stage in the absence of the examiner. The General Science Sub-Committee of the Science Masters' Association, when considering examinations in General Science, wrote as follows:¹

It will have been noticed that, so far, we have not mentioned practical examinations. This does not mean that we consider practical work to be of little importance, but we are not convinced that the practical tests of the kind now common fulfil any useful purpose. They are often little more than disguised theoretical tests and, in any case, chance plays far too large a part in them. Above all, they do little to test ingenuity, ability to plan an experiment, manual skill or dexterity; they are scarcely *practical examinations* [at pp. 67, 68].

The continuance of purely written examinations in a subject that should be based on practical work is bound to have unsatisfactory results. I believe that science teachers would be able to devise more suitable tests in the various sciences if they were able to collaborate through a regional examination system, which would enable all the teachers to meet before the examination to discuss requirements, examiners to be present during the tests, sets of special apparatus to be passed from school to school, and so on. There would be no objection to teachers helping to examine each others' students, provided they were administering a set examination and not merely using their own individual judgments.

GENERAL SCIENCE. The growth of General Science as a School Certificate subject replacing the separate subjects, Chemistry,

¹ *The Teaching of General Science*, Part II, Science Masters' Association, John Murray, 1938.

Physics, and Biology, has undoubtedly had a good influence on school science, but it has brought with it certain dangers. The General Science movement became crystallised in the *Report* of a Sub-Committee of the Science Masters' Association already noticed on p. 144. It has led, in those schools which follow a General Science syllabus, to the pruning of many out-of-date items from the science course, to the breaking down of barriers between subjects, and to the closer association of science lessons with everyday life. But its adoption has increased the possibility in some schools of science becoming a book subject not sufficiently linked with practice. It is true that the items in the syllabus are more closely allied to everyday experience than was the case with the old subjects, but there is a danger that students read explanations of everyday phenomena which they think they understand, but which have not been assimilated by practical experience.

The adherents of the General Science school of thought among science teachers have no desire to see science reduced to a form of general knowledge assimilated without understanding, but the very breadth of the course makes it difficult for the inexperienced teacher to prevent this happening.

Unfortunately, we have witnessed a cleavage in school science between a General Science trend of thought in some schools and an orthodox school in others. In the violent clash of opinion the simple fact that all are trying to teach the same subjects gets overlooked. The General Science schools find themselves faced with new and difficult problems that are unknown to the teachers in the orthodox schools, and the latter suffer from the fact that many of their progressive colleagues have interested themselves exclusively in the parallel subject instead of helping to modernise orthodox syllabuses. Many of the current problems in the teaching of science would be solved if these two streams came together again, and the examining bodies could do much to foster a reconciliation. They have helped to encourage and develop the General Science stream by introducing the subject as an alternative in the School Certificate Examination. Now that the number of candidates

taking General Science exceeds that taking any other science, steps should be taken to bring the syllabuses, question papers, and examiners into closer relationship with each other, so that General Science, Chemistry, Physics, and Biology come to be regarded as parts of a common subject, Science.

SCIENCE AND THE SPENS REPORT. The fashion of considering General Science as something different from other science, combined with the absence of any practical requirement in the School Certificate Examination in General Science, is in danger of creating a new tradition of science teaching divorced from the sound old tradition of theory closely associated with practical work, and relying too much on popular textbooks supplemented by demonstration experiments. The reality of this danger may be judged from the following unfortunate analysis of the aims of science teaching which was incorporated in the *Spens Report*:

Among the chief aims to be sought in the teaching of Science in schools, we suggest the following:

(i) It should give pupils some knowledge of the natural laws which operate in the universe and of their application. This is an appeal to wonder and to interest, as well as to utility.

(ii) As a complement to historical studies, it should reveal the influence of scientific thought and achievement in the evolution of our present-day civilisation and perhaps even more important, it should indicate its possibilities, for good and evil alike, in the future of the human race. The appeal here is to social interest and social utility.

(iii) It should give children an introduction to scientific methods of thought and investigation. This appeal is essentially one to the intellect and, in so far as it is achieved, Science takes the place of the mediaeval study of logic.

It is useful to give some consideration to the relative value of these aims, since most existing courses appear to have concentrated unduly on the third to the exclusion of the first and second. Training in scientific method has a special value for pupils who will pursue a career in which science is of prime importance, but we feel that there are valid arguments for teaching science to all girls and boys without reference to their future careers, and we would claim that science should be taught, as Latin was taught in the Middle ages, because it

is useful—useful to the individual as an element in his own life and useful to him as the indispensable background of much current thought [a. pp. 244, 245].

It is difficult to believe that this passage, which is so foreign to all that science has stood for, was written by a scientist. This part of the *Spens Report* has escaped with so little comment that we shall devote a few pages to analysing and combating its implications.

The first 'aim' is to arouse a sense of *wonder* in the children at the natural laws which operate in the universe. No mention here of *understanding*, or of the fact that these natural laws are merely man's attempts to describe natural phenomena—to pick up a few pebbles on the beach of knowledge. One of the main contributions of science to human progress has been the substitution of understanding—in the sense of looking beneath the surface and seeing how things work—for wonder and awe. Yet the Consultative Committee would have the science teachers make their appeal to wonder.

The second and third 'aims' involve the relationship of science to other subjects and the meaning of the term *scientific method*. We have noticed that, in school and university, science means the physical and biological sciences, both pure and applied. The word is, however, often used in a more general sense, as in the expressions historical science, moral science, social science, military science, etc. Psychology and geography also lay claim to be considered as branches of science. In this book we are careful to use the word in its more restricted sense, the sense in which it appears also to have been used in the *Spens Report*.

The use of the term 'scientific method' may conceal a confusion of thought. The late Professor H. E. Armstrong was fond of the term, and explained its meaning as follows:¹

The great mistake that has been made hitherto is that of attempting to teach the elements of this or that special branch of Science: what we should seek to do is to impart the elements of scientific method

¹ Address to the Education Section of the British Association at Melbourne on August 14, 1914.

and inculcate wisdom, so choosing the material studied as to develop the intelligent appreciation of what is going on in the world. It must be made clear, in every possible way, that Science is not a mere body of doctrine but a method: that its one aim is the pursuit of truth.

What is this essence that Armstrong would have us distil from the various sciences? The great achievements of the last few hundred years have undoubtedly followed from the fact that the investigators in every field which has been successfully mapped have approached their subject without preconceived notions, and have refused to allow any theory to be accepted unless it could be shown by experiment or experience to fit the facts. But the methods of physical science, in which measurement is dominant, differ from those of biological science, and neither has been able to provide the key to social science, which is still in its infancy, if not in the pre-natal stage. Thomas Huxley described science as 'trained and organised common sense', a development of the same methods by which man learnt to light a fire, to make a wheel, to extract metals from their ores, to write, and to elect a committee. It is the method of trial and error in relation to experience, the method of drawing general inferences from actual facts, of testing those inferences, and of applying them in practice. It may demand knowledge of wide ranges of facts, meticulous attention to detail, accuracy, persistence, independence, courage, and ability to work with others. It may require historical training, literary training, mathematical training, and may be influenced by religious belief, appreciation of the arts, home life. The methods necessary for success in the various branches of science do not differ radically from the methods necessary for success in other walks of life, where success is measured by achievement: nor have they more in common.

We have to be on our guard against two opposite mistakes when considering the relationship of the different sciences to each other, and to other branches of human activity. The first, which the General Science movement has done much to combat, is the mistake of allowing the various sciences to become isolated from one another, and from everyday life. The

second is of imagining that the methods of all the sciences are the same, and that there is, therefore, nothing to be gained from studying them separately. The apparent contradiction between these two statements (stressing respectively unity and separation) should not present any difficulty to the scientist, because two of the most important instruments of all branches of scientific thought are (a) the separation of similar things into qualitatively different categories—the parts of the vertebrate nervous system, real and virtual optical images, the three states of matter, the chemical elements, and (b) showing the continuity and connections between such qualitatively separate categories—the unity of the nervous system, the absence of discontinuity in the image as an object passes through the focus of a lens, the continuity of properties between the solid, liquid, and gaseous states, the periodic classification of the elements. Similarly, while Physics, Chemistry, Biology have many common features and meet on common ground, they deal with different sorts of problems. This is recognised by the Science Masters' Association General Science Committee in the following passages:¹

One method which is commonly used by those who teach General Science is known as the 'topical' method, of which Faraday's *Chemical History of a Candle* provides an outstanding example. Using this method, the teacher may pay no great attention to subject divisions: a topic such as air, water, radiation or metals is chosen, and it is then considered from many points of view. 'Air', for instance, would lead to considerations of pressure, burning, balloons, breathing, and so on. It is claimed for this method that, by breaking down the barriers between Physics, Chemistry and Biology, the fundamental unity of our subject is revealed. When, however, an attempt is made to define this unity, it is found to be very elusive; and, though it is clear that nearly everyone does indeed feel that it exists, it seems probable that it does so only as an ideal in the mind of the man of science, rather than in the product of his work [at pp. 22, 23].

Any single scientific subject consists of an orderly array of facts and phenomena unified by the systematic application of fundamental

¹ *The Teaching of General Science*, Interim Report of the Subcommittee of the Science Masters' Association appointed in 1935, John Murray, 1936.

principles. Whatever scheme teachers may adopt, it will be found in practice that they soon group like with like so as to exhibit logical connexions, thereby reaching a division of their field of study not so very different from that usually adopted. This classification of Science into subjects may be conventional, but it is not entirely arbitrary [at p. 23].

When the word Science is used in its more general sense to embrace the study of all aspects of human activity and knowledge, it becomes more than ever necessary to recognise the qualitative differences between the different branches to which the word is applied; and to use the expression 'scientific method' only in the very general sense that we have described. We can then say with some truth that the study of History or Sociology will produce useful results in so far as it is undertaken by scientific methods, but we must be quite clear that this means the particular methods appropriate to Historical Science or Social Science as the case may be, and not the methods of Physics, Chemistry or Biology. 'Science' and 'scientific method' are then used to denote study and activity based upon the open-mindedness, and the readiness to abandon ideas, theories, and principles when they fail to pass the test of experience, that have characterised successful scientific investigation since the Renaissance; as opposed to study and activity based on authority or on preconceived notions, never honestly put to the test of experience. Nor must we allow the term 'scientific method' to be used for a vaguely conceived attitude that is often presumed to-day to be something that can be easily acquired by anyone who is prepared to take a little trouble—a key that will open every lock; something to be read about and discussed like the Modern French Schools of Painting, and studied with the aid of a few films and demonstration experiments or a visit to an Art Gallery as the case may be. To repeat, science, in the current use of the word, is the study of certain parts and aspects of the world, just as history is the study of other parts and aspects of it. The solution of the present problems of humanity will not necessarily be solved by the methods of physical or biological science; in some

ways the methods of military science are more nearly applicable to the solution of social problems, because they envisage action by the student and not mere passive understanding.

Returning to the second aim for science teaching given in the *Spens Report*, we find that it invites the science teacher to discuss the social implications of science. This is a dangerous proposal. It is asking him to venture into fields of knowledge and activity for which he is not trained. It is also denying to sociology the right to be considered and studied as a separate subject with its own methods. It carries the implication that physical and biological science can either be praised or blamed for the uses to which their discoveries have been put. By all means let us arouse interest in social problems, but let these matters be treated by qualified people, or, in the absence of qualified people, not at all.

The third aim appears to assert that scientific methods of thought and investigation are confined to the intellectual sphere, seeing that it is suggested that they take the place of 'the mediaeval study of logic'. Yet logical thought remains an essential part in the *exposition* of any piece of understanding, although its value in the *achievement* of understanding has often been exaggerated. The important point about scientific thought is that its basis is in the world of experience, by which its results are continually tested. The student learns to build up a mental conception which is the more valuable to him the more it corresponds to the external world or the world of experience. His logical training helps him to describe that mental conception in words and thence to clarify it. The suggestion that science is mainly a matter of the intellect appears to hark back to Greek thought and to ignore the fact that science owes its success to its refusal to be content solely with intellectual processes.

The suggestion in the final paragraph that 'training in scientific method' is unnecessary except for those who will 'pursue a career in which science is of prime importance', together with the claim that science should be taught to the ordinary citizen 'as Latin was taught in the Middle Ages',

because it was useful, reveals a failure to understand the significance of a knowledge of science. Latin was useful in the Middle Ages in the same way that a knowledge of written English is useful to-day, as a basis for acquaintance with the thought and writings of the most important sections of the community. The *Report* thus suggests that the use of science to the ordinary citizen to-day is as the basis for acquaintance with the thought and writings of important sections of the modern community. It is certainly true that no one can claim to be cultured unless he is familiar with scientific nomenclature and thought, but this is surely not the main reason for teaching science to children. The use of a true knowledge of any science to the ordinary citizen is that it imparts to him the power to deal successfully with problems, great or small, *in the field of that science*. This kind of knowledge arises from active participation in the subject-matter of the science. It involves the intimate association of abstract concepts with action and experience. The selection of topics from the everyday experience of the student may help to secure this, but only if the instruction is itself practical.

PRACTICAL SUBJECTS. These are subjects in which the final outcome of activity is not expressed mainly in writing. They include Drawing and Painting, Singing and Instrumental Music, Cookery, Needlework, Woodwork, and Physical Training. Fortunately, it has always been recognised that an examination in these subjects should not be entirely written. It may include a written paper dealing with theory, but the main test must consist of making a drawing, painting, singing, playing an instrument, cooking, constructing an object in wood, sewing, or doing physical exercises. In needlework, woodwork, drawing, and painting the finished product can be sent to the examiner, so that the problem is not much different from that of a written examination, but in cookery, music, and physical training we can only secure direct competition by collecting the students together in one place or by arranging that a single examiner or one of a team of carefully

trained examiners visits every school. Unfortunately, random distribution of schools makes it difficult either to arrange visits of examiners, or to gather the students together. These difficulties have been surmounted in Cookery, where the number of candidates is still comparatively small, as it has in French oral examinations, by sending round examiners, but the difficulties nevertheless are considerable. For example, Oxford, Cambridge, and London each send examiners into Devon and Cornwall to carry out the School Certificate Cookery tests, and there is virtually no contact between these examiners. The tours and tests have to be arranged from a centre many miles away, so that, to ensure fairness, rules and regulations have to be sent out in circular form. The examiner arrives in a town to examine, perhaps, only one of its three secondary schools just before the examination begins, and leaves as soon as it is over. It is not surprising that the whole affair should seem to the teachers very impersonal and more like the imposition of an external authority than a competition between the children in different schools. Regional grouping of schools is the only satisfactory way of surmounting these practical and psychological difficulties.

The following scheme for Music examinations has been adopted by the Cambridge and Oxford Examining Bodies in co-operation with the Associated Board of the Royal Schools of Music. The examiners who periodically tour the country conducting practical examinations in music for the Associated Board also carry out the aural tests for the School Certificate and Higher School Certificate Examinations. This system works well. Something similar could be worked out between the examining bodies and the National Council of Domestic Studies. In the absence of a regional arrangement of examinations, I think efficiency demands the central organisation of cookery tests through collaboration of the examining bodies. But this requires prior agreement on syllabus, and is not likely to lead to the kind of close collaboration with the schools that is so desirable. A regional examining body could take the cookery teachers into partnership much more effectively than a national joint organisation of the present examining bodies.

CHAPTER IX

THE BOARD OF EDUCATION'S PART

WE are apt to think that the problems raised by the war are transient and should be ignored when making plans for the future. This is a mistake. The war searches out our weaknesses and forces us to correct many of them, but the weaknesses were there all the time. Overdue improvements, made imperative by the war, will be found to have prepared the way for further advances. Thus, the complete cessation of the activities of the Secondary School Examinations Council during the war may be an indication of its unsatisfactory constitution; while the way in which the examinations have been carried on in spite of the difficulties of the times bears witness to their importance in the educational system. The weaknesses revealed by the strain of war conditions can be used as indicators of correct reforms. The haphazard distribution of schools among examining bodies furnishes an example of this principle. As transport becomes more congested, meetings of people living in different parts of the country, which were formerly merely inconvenient, become impossible. Postal delays make distant schools more remote and remind us how dependent we have become on our exceptionally efficient communications. It is sometimes suggested that the British Isles are so compact, and their transport, postal and telephone systems are so efficient that regional organisations of examinations would be unnecessary under normal conditions. This is like saying that a house is so compact compared with a hotel that there is no point in placing the dining room near the kitchen and the scullery; or that London has so efficient a transport system that there is no disadvantage in people travelling fifteen miles to and from work every day. Efficiency is relative. The fact that we have an excellent system of communications does not justify an organisation of examinations which falls short of the best possible.

It is interesting that the advantages of regional organisation of schools have been recognised independently of examinations. For example, Mr Henry Morris, Director of Education for Cambridgeshire, makes the following plea for 'rural regions' in education:

My own suggestion is that the Universities of Britain should add another function to those of research and teaching; that they should share with the Local Authorities the responsibility for the education and culture of the whole community of their surrounding region—from the school to the adult stage.... The qualitative excellence of the schools should be maintained, not by inspection, but by the federation of all the schools of a region to the educational faculty of the regional University. It should be the task of the University and its educational faculty to help in maintaining the cultural life and the technical efficiency of the teachers throughout their career.¹

The regional examining body that we are advocating would provide the machinery for the kind of cultural association of universities, Local Education Authorities, and schools envisaged by Mr Morris. There is much to be said for bringing the Faculties of Education into the picture by linking them directly with the examining bodies. As 'secondary education for all' becomes more of a reality, the number of regions will have to be increased and their size reduced to deal with a greater number of schools, and we shall thus approach the ideal of joint examinations run by the schools within a compact region in association with the nearest university.

These examinations should be based on regular meetings of all the subject teachers to discuss their common problems and to arrange their common examinations. The marking should be carried out by teachers within the region, assessing the work of each other's students according to an agreed scheme. The drafting of question papers or other exercises would be allocated to teachers outside the area or those not presenting students for the subject, or even to an inspector or university teacher

¹ 'The Rural Pattern', by Henry Morris, *New Statesman*, August 21, 1943 (a review of *The Education of the Countryman*, by H. M. Burton).

under the strict supervision of the school teachers or their representatives. In this way a serious defect of the present examinations would be removed, namely, 'that the examiners do not have an adequate opportunity of discussing the candidates' work with their teachers. If the examinations were, widened in scope as indicated in the preceding chapter, they would form the basis for all kinds of cultural collaboration and competition between schools. They would enable universities, public schools, and all types of secondary school to see themselves as part of a common educational enterprise. All the schools within the region would form a single educational unit, as the colleges in Cambridge form one university, so that the examinations would be *internal* for this unit, but *external* (according to the definition on p. 51) for each school within the unit. Perhaps this would be a comfort to those who are attracted to the idea of internal examinations.

STEPS TOWARDS REGIONAL JOINT EXAMINATIONS. However, it is one thing to demonstrate the advantages of a regional scheme, but another to show how the objections in people's minds are to be sufficiently overcome to make its introduction practicable. The fashionable plan is to draw up a scheme which is admitted to be inapplicable at the moment, and to suggest that it shall be introduced 'two years after the end of the war'. To my mind, a better way is to show the direction in which development should take place, and then to indicate what immediate steps may be taken in this direction. We have seen that any steps towards a greater measure of school control of the examinations will facilitate regional organisation, just as regional organisation will facilitate school control. We ought then to foster any tendencies in either of these directions. I know that two of the examining bodies have been considering the possibility of entrusting the conduct of the School Certificate, if not of the Higher School Certificate, examinations to a joint committee of school and university representatives, or even to a committee of school teachers. This compromise would be in the right direction. The Headmasters' Association, the Head-

mistresses' Association, and the Headmasters' Conference might adopt a policy recognising the advantages of a school taking the examination of the nearest body. The examining bodies might develop plans for giving schools near at hand the advantages of visiting examiners which were only available to distant schools on payment of a special fee, thus encouraging schools to rearrange themselves regionally. Annual meetings of subject teachers within reach could become the rule. The Universities of Oxford and Cambridge could make a special contribution on the following lines: collaboration between the Cambridge Local Examinations Syndicate and the Cambridge half of the Oxford and Cambridge Joint Board, and between the Oxford Local Examinations Delegacy and the Oxford half of the Joint Board could be arranged with the ultimate object of the fusion of these bodies, and the division of the Joint Board into two parts, so that the present three examining bodies were replaced by two new ones centred in the two university towns. This, of course, would be a gradual process.

Alongside of these modifications, the existing examining bodies should pool their resources more completely with the agreed object of making it easy for schools to transfer from one examination to another nearer at hand. At present, there is a tendency for one body to develop along certain lines, and another along different lines, with the result that there may be appreciable differences in efficiency in certain respects and that schools are therefore unwilling to make a change. I do not see that there is any reason to call for complete uniformity. In fact, the existence of separate examining bodies gives opportunity for experiment which should not be neglected. But the form of the published results, the fees charged, etc. should be the same. These ends could be achieved by a certain amount of interchange of staff, more regular interchange of information, joint discussions extending over several days, not confined to a few hours as at present, and a more effective Secondary School Examinations Council with its own headquarters. We have already said enough about this body in other chapters to show that it is not suited by its constitution

to carry out its many tasks;¹ yet the reforms we are advocating are dependent upon the existence of an effective co-ordinating body. As the regions become more clearly established, the need for co-ordination will become more obvious.

A CURRICULUM AND EXAMINATIONS COUNCIL. The reconstituted Secondary School Examinations Council will have a triple function to perform. It will co-ordinate the examinations of the regional examining bodies; it will co-ordinate the activities of the national subject councils; and it will act as a link between these bodies and the Board of Education. The main framework of its membership should thus consist of representatives of the examining bodies and representatives of the subject councils. These representatives should, of course, be elected or appointed by their own bodies, not by the Secondary School Examinations Council or the Board of Education. I see no reason why there should not also be representatives of the national organisations of the Teachers' Associations and of the Local Education Authorities, as at present. The Council should, of course, also include representatives of the Board of Education.

Since the Board of Education has never accepted the principle that examinations should influence curriculum, the Council is not, at present, supposed to be concerned with this aspect of education. My proposals seek to rectify this position by placing the Council at the head of machinery competent to deal both with examinations and curriculum. At the risk of frightening the reader by a display of apparently complicated machinery, I have represented the arrangements proposed in two diagrams. The first shows the connections between the examining bodies, subject councils, and Board of Education through the Secondary School Examinations Council, which I should like to see

¹ The constitution of the Council was altered a few years ago. It is now an unwieldy body consisting of ten representatives of Examining Bodies, ten of Local Education Authorities, ten of School Teachers; together with three Assessors, a Chairman and a Secretary appointed by the Board of Education. It has a Standing Committee of twenty.

DIAGRAM OF PROPOSED CO-ORDINATING MACHINERY
BETWEEN REGIONS

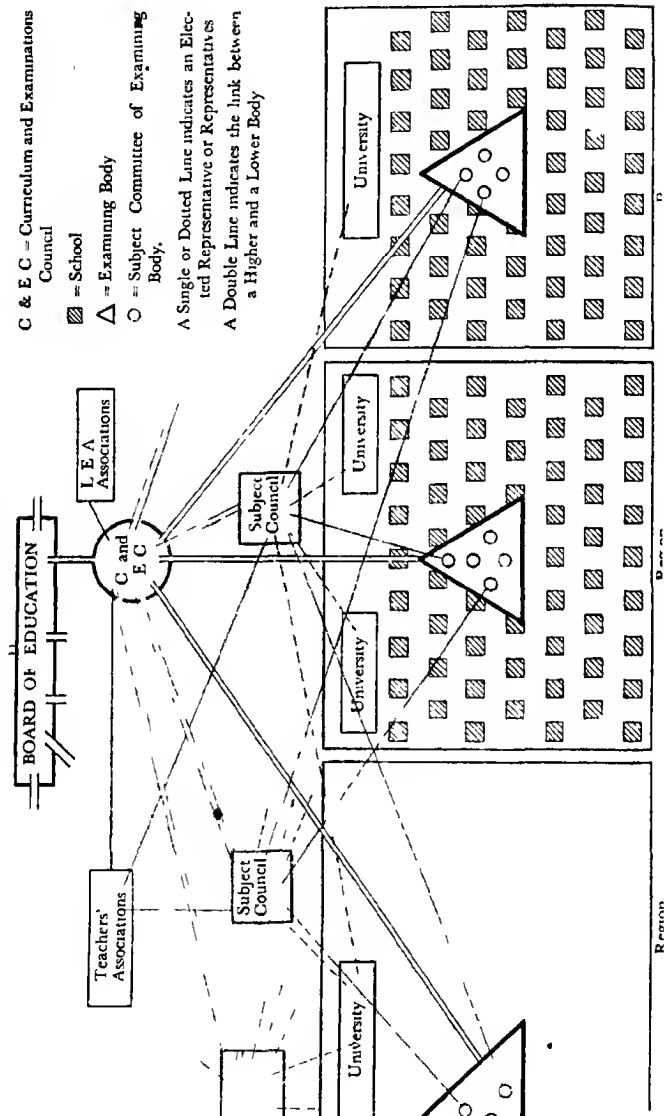
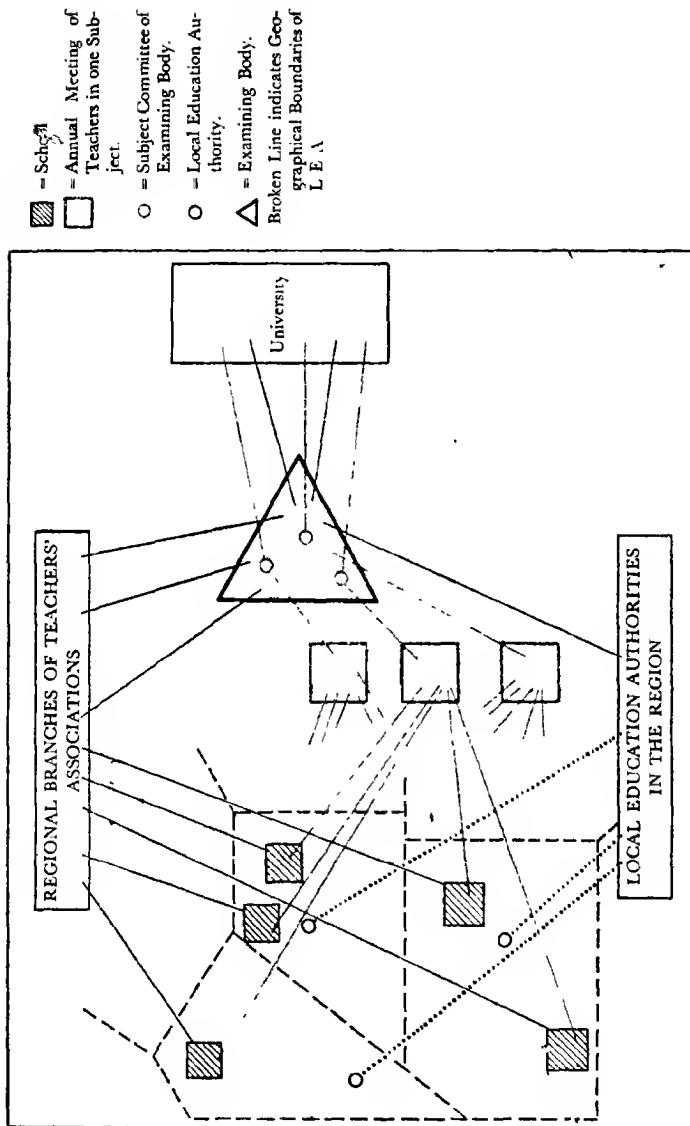


DIAGRAM OF A SINGLE EXAMINATION REGION



re-named the Curriculum and Examinations Council, and the second shows the connections within one region between schools, university, and teachers' associations through the examining body. In both diagrams, the examination organisation is shown in black, and the subject organisation in red. Both red and black systems are under the general control of the Curriculum and Examinations Council, as indicated by the double lines in the first figure, where the red squares represent subject councils, and the black triangles examining bodies. The red circles within the black triangles represent the subject committees of the examining body.

In its relationship to the examining bodies, the Curriculum and Examinations Council can be viewed in two ways—as a joint co-ordinating committee of the examining bodies, and as a superior guiding authority accepted by them. Let us leave out of account for the moment the function of the Curriculum and Examinations Council in forming a link with the Board of Education, and consider only its function as a co-ordinating body run jointly by the examining bodies for their mutual benefit.

Co-ordination is essential, because upon it depends the value of the certificates issued and the standards defined by the various examining bodies. The public and the bodies accepting these certificates or standards judge them on the assumption that they are equivalent. If one examining body accepts a notably lower standard for some qualification which goes by the same name for all examining bodies, the resulting loss of confidence in this qualification affects all. Similarly, in the realm of syllabus, the value of the certificate examinations to the universities depends to a considerable extent upon their interchangeability. The examining bodies thus require co-ordination in their own interests.

On this basis, then, what will be the relationship between the individual examining body and the Council? Three principles seem to emerge. In the first place, the examining bodies elect and send their own representatives to the Council. Secondly, the success of the Council as a co-ordinating body

depends upon its ability to retain the confidence of its constituents. Thirdly, an examining body expects to bow to the authority of the Council in matters on which the Council is the better judge, but not on matters where questions of common policy do not arise. The same considerations apply as between the Subject Councils and the Curriculum and Examinations Council.

The differentiation of function between a higher body and a lower body arises from the ability of the former to view the activities of the latter in relation to matters which come within the province of the higher but not of the lower body. Authority is seen to rest on mutual advantage. On the question whether the examining bodies and the Subject Councils send 'delegates' or 'representatives', it is obvious that if the Council is concerned, not merely with taking decisions, but also with translating them into practice, it will see no advantage in a vote without a mandate on subjects which have not previously been discussed. On the other hand, where there is full mutual confidence, delegates can often rely on their ability to carry those whom they represent with them on urgent matters which have to be settled without time for full discussion. The essence of democratic organisation, as of democratic government, is confidence.

THE BOARD OF EDUCATION AND THE OUTSIDE WORLD OF EDUCATION. Let us now consider the more difficult question of the relationship of the Curriculum and Examinations Council to the Board of Education. Our educational system is dual in another sense from that in which the expression is now so commonly used. On the one hand, we have the schools, universities, examining bodies, teachers' associations, educational publishers, and Local Education Authorities with which the greater part of our discussion has been concerned. On the other hand, we have the Board of Education and its Inspectorate. The history of the one has been of ancient and independent schools and universities, entirely separate from the state machinery, gradually supplemented by private schools,

church schools, board schools, professional bodies, and, later, partly controlled by the Local Education Authorities; the whole loosely bound together by the examination system, the teachers' associations, associations of education committees, educational press, textbooks, etc. This outer world of education has close connections with the public at many points, but especially through local government, parents, teachers, and the press.

The Board of Education has developed as a parallel machinery which is responsible only to Parliament. It started with little or no rights over the independent institutions, but has gradually forged links with them through the financial control vested in it by various Acts of Parliament. The most important of these links are: the Inspectorate, the control over schools and teachers through the Burnham pensions scheme, the control over Local Education Authorities through block grants, the control over otherwise independent schools through direct grants, State Scholarships and State Bursaries, and a large number of administrative memoranda, handbooks, etc. In these ways, the Board of Education now exercises considerable control over a system that remains, even to-day, mainly separated from it. This singular position gives rise to an un-confident attitude on the part of the Board in its dealings with those institutions over which it has least control, and may lead to a compensatory inflexible attitude in other directions. People who have to deal with it find the Board a most elusive body. Even its name is misleading, since, for all practical purposes, there is no 'Board'. One suspects that almost all decisions are taken individually or jointly by civil servants who are responsible in the last resort only to the President of the Board and so to Parliament. A symptom of the cleavage between the Board and the rest of the educational world is seen in its practice of appointing 'Assessors' on other bodies instead of ordinary representatives. These Assessors take part in the discussions but do not vote—an unsatisfactory state of affairs on any committee. The conception of committee work that we have put forward would allow the Board to appoint representatives like any other body; their

presence would merely emphasise the fact that no committee should override one of its delegate members without taking full account of the consequences.

What place does the present Secondary School Examinations Council occupy in this dual system? The Secondary School Examinations Council was called into being by the Board of Education to form a link between itself and an examination system which had formerly been outside its orbit. The Board appoints the Chairman (and the Secretary), but the rest of the members represent the outside world of education. The Board holds the ultimate power of control through the examination fees, but has expressed its intention of being advised by the Council in all matters concerning examinations.

The relationship of the Board of Education to the Secondary School Examinations Council is of more than ordinary interest to us because it is probably typical of other contacts between the Board and the outer world of education. These contacts are largely consultative, but, as everyone knows, there are many ways of taking advice. One is in the tradition of the proprietor of a concern consulting his managers. He interviews them, together or separately, and then goes away and takes a decision which may or may not correspond with the results of the discussions. This method involves no sharing of responsibility and leads to little real co-operation, for the staff know that they may be overridden without explanation, perhaps on the advice of someone in the background. Another is in the democratic tradition of organisations or departments where responsibility is shared in due proportion by higher and lower officials. The essence of this method is that discussion and decision take place at the same time, so that those who have given an opinion also take their due part in deciding what action shall follow. This implies such a measure of wisdom and good sense on the part of the higher executives as to lead their subordinates to accept and co-operate in the decisions.

Many proprietors have the good sense to adopt the second method, and some organisations and departments suffer from dictators who revert to the former, but the difference is more

than one of personalities, and often more than of tradition. The universities are at present the proprietors of the examining bodies, so one ought not to be surprised if their relationship to the schools is sometimes one-sided and unsatisfactory. But the Board of Education cannot claim that its position in relation to education corresponds to that of a proprietor, except as the agent of the parents, teachers, professional bodies, universities and Local Education Authorities who are represented in Parliament and also on the Secondary School Examinations Council and similar bodies.

REFORM OF THE BOARD OF EDUCATION. We do not expect the Curriculum and Examinations Council to be given an entirely free hand to deal with curriculum and examinations, for it is obvious that these departments of educational policy have to be co-ordinated with others through the Board of Education. But the relationship between the Board and the Council should be straightforward and open, so that each knows what the other is about. It is difficult to see how this can be achieved until the Board of Education is reorganised and the empty chairs in the 'Board' room are filled by representatives of every aspect of our educational life, including at least one appointed by the Council. When the President of the Board of Education raises his voice in the counsels of the Government or in the House of Commons, he will then be expressing the active policy of the whole complex educational system worked out by the Board over which he presides.

The Board of Education will not be able to fulfil its function as the central directing influence in education until the gap which separates it from the outside world of education has been closed. In the realm of examinations the gap is at present supposed to be bridged by the Chairman of the Secondary School Examinations Council and the four Assessors appointed to serve on that body by the Board of Education. When the principle is accepted that a democratic Board of Education includes representatives of the Council among its members, we shall have the machinery for building up confidence and

a sense of real responsibility among the members of the latter body, instead of a feeling that their carefully considered decisions may be overruled without adequate explanation. In my opinion, a Chairman should always be appointed by the body over which he presides. If he has to serve on a higher body, he can then represent the lower body effectively. Under the present system, the Chairman of the Secondary School Examinations Council has to serve two masters, and much depends upon the personality of the particular occupant of the post. I am not suggesting that, when the Council appoints its own Chairman and he sits on a reconstituted Board of Education, the gap will automatically be closed. The Chairman will still have to avoid the *Scylla* of associating himself too much with the Board of Education and trying to use his exalted position to dictate to his Council, and the *Charybdis* of failing to make his presence, and therefore his Council's desires, sufficiently felt in the affairs of the Board. Typical of many other links in the chain of higher and lower bodies, he will have his superiors at the back of him and his colleagues or the people themselves in front, and it will be his personal duty to influence both and to allow both to influence him. But a lively Council will be constitutionally able to see that he fulfils his function adequately.

It might be thought that the democratisation of the relationship of the Board of Education to those over whom it presides, or is supposed to preside, would weaken the Board's authority. This is the reverse of the truth. The Board's effective authority would be increased, because it would have at its disposal machinery for explaining policy to those who have to carry it out, and for educating them to do so. The Board would lose its license to issue instructions without effectively consulting those who are in the best position to advise, namely, the organisations whose members will be affected by the instructions, and the bodies responsible for carrying them out. We shall have the machinery to enable the schools to impress their views on the Government as effectively as the Government exercises control over the schools.

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Reform of the Board of Education is being demanded from all quarters, by people not concerned directly with examination or with secondary schools, as well as by teachers. The following is an extract from an article in the *Journal of Education* by a secondary school master,¹ which envisages an extension of the Board's functions in guiding and helping the teacher. The writer would like to see established an Institute of Education under the direction of the Board of Education. It seems to me that the new Curriculum and Examinations Council, for which I have shown the need, might well have charge of such an Institute:

The educational world appears to be satisfied with the spirit in which the Board exercises its present functions; in particular it commends the advisory rather than dictatorial tone of its inspectorate and memoranda.

Yet the reform of the Board could play a great part in giving education its rightful status in national affairs, in creating a system worthy of that status, and infusing into the system that progressive spirit, that enthusiasm, which makes an organisation live, and keeps it in harmony with the rapid changes of the outside world. . . .

The reform needed is not so much the changing of the functions of the Board as a vast extension of them. At present the Board sets out the broad outlines of the curriculum, inspects schools, issues memoranda and circulars, organises holiday courses for teachers, collects statistics, sets up commissions of inquiry, prepares legislation for Parliament, and performs various other tasks of an administrative nature. Most of this work is important and most of it is well done; it is, however, meagre in comparison with what might be. The educational system sometimes seems to be an organism without a heart, lacking a central source from which to draw new power and vigour. Though it is in keeping with British tradition that much of the power and initiative should come from the work of the teachers themselves, there remains a field in which . . . nothing less than national action will suffice. . . .

We must build in the near future a great National Institute of Education. The direction of the activities of this Institute would be an important part of the Board's duties. . . . Each subject would have

¹ 'The Functions of the Board of Education', by Reginald R. Dale M.A., M.Ed., *Journal of Education*, April, 1943.

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its own suite of rooms, and each group of allied subjects its sound film projection room....

...There would be sub-committees for each group of subjects.... In all this work care would have to be taken not to restrict unduly the activities of private individuals, groups or firms engaged in similar work. Such groups might well be given assistance, if desired and merited. Some of them are already doing valuable pioneer work [at pp. 155, 168].

Without going into details, it seems to me that such an Institute would give the outer world of education a foothold at the Board of Education, and would serve as a headquarters for the work of Subject Councils and a Curriculum and Examinations Council.

IMMEDIATE STEPS. As I have said, we cannot expect to see a sudden modification of the present system on the lines we have indicated in this chapter and Chapter VII, but I think the following steps could be taken at any time:

1. *The Secondary School Examinations Council* could demand the right to elect its own Chairman and to be represented at the Board of Education when decisions are taken on any matters concerning secondary school curriculum. It might appoint a full-time or part-time Secretary paid either by the examining bodies or by the Board of Education.

2. The Council could appoint a committee or committees to deal with curriculum in co-operation with the subject panels of the examining bodies, the subject associations, and any *ad hoc* bodies that may be in existence.

3. *The Examining Bodies* could arrange regular meetings of the teachers in each subject in the schools taking their respective examinations. The examiners would be present at such meetings and discussion would take place on past and future examinations. Delegates could be appointed to represent the teachers present on the subject panel or committee of the examining body.

4. More realistic steps could be taken by the Examining Bodies through the machinery of the Secondary School

Examinations Council to secure co-ordination of standards and methods.

5. *The Teachers' Associations* could encourage schools to take the examinations of the body nearest at hand, with a view to obtaining closer collaboration between all the schools and universities in an area.

6. *The Universities* could take appropriate steps to bring the schools more into partnership on their examining bodies, and to make these bodies more explicitly their official machinery for all kinds of co-operation with schools.

7. The universities could also begin to confer with one another on their Matriculation, Intermediate, and Scholarship requirements, either through the machinery of the Secondary School Examinations Council or independently of it.

These steps envisage two changes in the Secondary School Examinations Council, namely, the establishment of a more efficient organisation with appropriate accommodation in London, and also the working out of a new relationship with the Board of Education. The universities will not be justified in giving up their ultimate control of the examinations until the Council has shown its ability, as a democratic body representing schools, universities and Local Education Authorities, to take a stand against bureaucracy and to constitute itself a real link with the Government and hence with Parliament. They could do no greater service to education than by using their influence and experience to increase the prestige of the Council.

CHAPTER X

THE NORWOOD REPORT

THE 'Norwood Committee's *Report on Curriculum and Examinations*, published on July 26, 1943, contributes nothing new to the discussion of our problems, but it provides a striking illustration of the principle that history waits for no one. Those who are unwilling to take the forward way out of their difficulties find themselves compelled to step backwards. Examinations came into being a century ago as a counter to arbitrary selection and private patronage, and they have remained a bulwark of fair competition ever since. They have gradually developed as an integral part of the educational system along lines which we have described, and have come to fulfil an important role in linking schools with each other and with the rest of the world. We have traced to their causes some of the objectionable features of the present examinations, and have indicated the kind of development and reorganisation needed to remove them. We have also called attention to the obstacles in the way of this reorganisation. The Norwood Committee, instead of grappling with these obstacles, condemns the whole system of examinations and envisages the substitution of internal for external examinations, a step which I believe would allow arbitrariness, favouritism, and patronage to raise their ugly heads again, and would cause a much greater disintegration of the secondary system than is yet fully realised.

The Title of the Norwood Committee. The title of the Committee is an example of the unsatisfactory relationship between the Board of Education and the Secondary School Examinations Council which we have discussed in Chapter ix. The *Report* is described on the cover as the work of 'A Committee of the Secondary School Examinations Council appointed by the President of the Board of Education'. To the ordinary Englishman this is a contradiction in terms. Either the Committee

was appointed by the Secondary School Examinations Council, and should report to it, or it was appointed by the President of the Board of Education, and is not a part of the Council machinery.

The Inspectorate. It is difficult to believe that the Norwood Committee did not consider the rearrangement of schools among the examining bodies on a regional basis. The need for something of the kind was mentioned in the *Investigators' School Certificate Report* in 1932¹ (Section 19, p. 20), and there was much talk of regional organisation in other connections at the time when the Norwood Committee was sitting. The Committee certainly did not overlook the need for co-ordination between schools and between teachers, but it has proposed to secure this by an enormously increased Inspectorate. The portion of the *Report* which deals with the Inspectorate seems to envisage a state educational service for teachers, which would provide for the transfer of teachers from school to school, from school to Inspectorate, and from Inspectorate back to school.

It would be foolish to deny the advantages of such a State service, but the *Report* issues a warning against the atmosphere of antagonism and mistrust between teacher and inspector that often accompanies such a system. It rightly draws attention to the co-operative spirit in which H.M. Inspectors have approached the schools in the past, and hopes to maintain these happy relations, when the present examination system has been removed, by changing the name of H.M. Inspectorate to H.M. Educational Advisory Service. But the educational public should realise the part that external examinations play in assisting the work of the Inspectorate. The School Certificate Examination has provided a framework of comparison between school and school which the Board of Education has never failed to utilise. It is a commonplace among headmasters that the first thing an Inspector does on visiting a school is to ask to see the School Certificate and Higher School Certificate results, which provide a starting-point for any discussions of the school work; and schools and teachers possess in these

¹ See footnote on p. 113.

results an independent tribunal for appeal against any possible arbitrary judgment on the part of the Inspectors. Moreover, external examinations, if run as we have advocated in close collaboration with the teachers, have the useful and unusual characteristic of being entirely impersonal. The candidates themselves settle the standard and examine their teachers in a very real sense. This gives a method of control that is vastly more flexible and less objectionable than any unaided advisory service. The unpopularity that might otherwise have been the lot of the Inspectorate has been reserved for the examining bodies. Internal examinations provide no basis for comparison between the candidates in different schools, and the Norwood Committee's Advisory Service would have to bear the burden of making the comparisons which are now automatically revealed by the examinations. In the last resort it would be one opinion against another.

In contrast to the Norwood Committee's plans for maintaining contact between teachers through the intermediary of a third party—the Inspectors—we have proposed in this book to utilise the machinery of regional examining bodies, on which the teachers themselves collaborate, to promote direct interchange of ideas. Besides being a member of his school community, the subject teacher is also one of many teachers of the same subject and, as such, needs the help of his colleagues in other schools. The joint examinations envisaged in this book will enable him to examine the work of the children taught by his colleagues on a basis of strict comparison according to agreed rules and not by arbitrary personal opinion. I want to see the subject teachers within a region brought together in the same room as often as possible to discuss their work in relation to their joint syllabuses and examinations. The value of a meeting of people engaged in a common enterprise and possessed of the machinery for putting their decisions into practice cannot easily be expounded on paper. Either people know from experience the difference between direct contact of this kind and indirect contact such as the Norwood Committee suggests or they do not know it. The result of my experience

is that the one releases energy and enthusiasm which the other suppresses. The Norwood Committee's opposition to these ideas is expressed, not only by their advocacy of internal examinations, but also by their insistence on the importance of the form master rather than the subject master.

Sixth Form Curriculum. The most difficult problems in the organisation of the advanced courses in secondary schools are concerned with the relationship of school and the succeeding university or professional training. Basically, the problems are independent of examinations and can be stated as follows. Schools, universities, and professional bodies have not yet taken the elementary step of meeting together and saying: 'Let us decide what we wish our students to learn, and how much of this shall be done at school and how much left for university or professional training.' Although the problem seems simple when stated in this way, its solution requires the setting up of the kind of machinery we have discussed in Chapter vi. The Norwood Committee does not appear to have considered the problem in this form at all. It has tried to find a short cut to a solution by tinkering with the very examinations discarded so lightly for the child of 16. As we have shown, examinations can be a useful instrument of policy, but only when the broad outlines of that policy have been clearly formulated in terms of curricula. An interesting analogy could be worked out between examinations in Education and currency in Economics. Both are media of exchange and competition, yet useless in isolation; both are used to define standards or values, and both are apt to be given too much importance in themselves. The problems of curriculum can no more be solved by mere juggling with examinations than economic problems can be solved by currency manipulation alone. Yet the educational reformer who does not take account of the principles underlying examinations is bound to fail.

“There is no substitute for slow and painstaking collaboration and planning of curricula and examinations through democratic machinery. The Oxford and Cambridge College Scholarship Examinations, the London External Intermediate Examination,

and the various First Medical Examinations have a pronounced effect on school work, but are not subject to school control. Many thoughtful people within the universities are concerned at the unforeseen influence which their examinations are having on Sixth Form work, and the separate universities are seeking separate remedies. Thus Cambridge is considering isolated action concerning the College Scholarship Examinations, London is said to be reconsidering its External Intermediate Examinations, the different Northern Universities have different policies about their acceptance of the Higher School Certificate, and the Norwood Committee have made isolated suggestions about the Higher School Certificate without consulting the universities. These activities, although certainly well-intentioned, seem to me to be misdirected. The various university examinations have grown up in response to definite needs, and the only sensible way forward is for the universities to confer with one another, and to arrange joint not separate consultation with the schools. Once there has been agreement on the partition of curriculum, these examinations can be modified to serve their own particular purposes and yet fit into the pattern of a modified Higher School Certificate examination, based on the most suitable Sixth Form courses for the various future careers open to the pupils. The Higher School Certificate Examination must clearly be the basic Sixth Form examination, because, unlike the other examinations, it can be conducted by representative examining bodies under the guidance of a suitable Curriculum and Examinations Council.

What does the Norwood Committee propose? It proposes that the Higher School Certificate Examinations shall be abolished, because they have to serve two purposes—as ‘qualifying’ examinations, and as a means of awarding scholarships. Their place is to be taken by (1) the Oxford and Cambridge College Scholarship Examinations, supplemented by similar examinations at other universities; (2) a set of new State Scholarship Examinations consisting of question papers with no syllabuses; (3) a new set of ‘qualifying’ examinations in which the candidates take only the subjects that they require

for exemption from other examinations. It is proposed that the present university examining bodies shall conduct the last two in place of the present Higher School Certificate Examinations.

These proposals amount to (a) abandonment of the principle that there should be a syllabus for all examinations, and (b) the division of the Higher School Certificate Examination into two parts—for the better and the weaker candidates respectively. The first proposal (a) ignores the lesson of half a century of examinations that scholarship question papers create their own syllabus and that there is no known method of controlling this kind of syllabus.¹ The proposal (b) is based on the double fallacy that there can be a qualifying examination which is not competitive, and that a scholarship examination is not a qualifying examination. The Committee's faulty analysis is summed up by them in the following sentence of their *Report* (p. 43): 'We do not suggest that...the Colleges should use this [School Leaving] examination; clearly that would be impossible since entrance is competitive, and the School Leaving Examination is qualifying.' We have shown in Chapter II that the definition of a qualifying standard depends upon competition, and it is well known that the Cambridge Open College Scholarship Examinations, which are competitive if any examination is, are used by the examiners to define two qualifying standards—known respectively as 'scholarship standard' and 'exhibition standard'.

The proposals will solve no problems, but will create new difficulties, and will divert attention from the urgent necessity for agreement between the universities, professional bodies, and schools as to the content of Sixth Form curricula and First Year university courses for students proceeding to different groups of studies in the university. The Report recognises this problem in its discussion of Sixth Form Science, but proposes to solve it by an *ex-cathedra* statement from the universities, thus indicating quite clearly that it is prepared to allow the universities to decide what is to be taught at school (p. 111). It is refreshing to find, however, that the discussion of the

¹ See Chapters III and VI.

influence of First Medical Examinations on Sixth Form work is more realistic and recognises the need for agreement between the schools and the medical authorities in the universities (pp. 112-13).

When agreement has been reached in all subjects, and co-ordinating machinery established, and when the various examinations conform to the accepted plan, the difficulty of using the Higher School Certificate Examination to serve several different purposes in relation to a single group of students will either disappear, or be traceable to the inclusion of unsuitable students in Sixth Forms. The plan to divide the Higher School Certificate Examination into two parts, for scholars and non-scholars, appears to me to result from (1) the failure of the Committee to propose methods of restricting university influence on school work, and (2) the fact that many students get into the Sixth Form who would be better outside it. Students should not I think be allowed to enter on a Sixth Form course unless they have done sufficiently well in the School Certificate Examination, and competition for the privilege should be thrown open to students from all types of secondary school.

The School Certificate Examination. The Norwood Committee's proposals for children at the age of 16 are even more difficult to understand. The Committee has bowed in advance to the storm of protest which would have met any immediate proposal to substitute internal examinations for the School Certificate. It has postponed a decision on this step for seven years, and has even left a loophole for abandoning it altogether. Instead of immediate internal examinations, we have the proposal to transform the School Certificate Examination into a subject examination. This means, apparently, that the choice of subjects is to be governed by the exemptions desired by the children. Further, there will be no definite qualification attached to success in the examination as a whole, so that 'Matriculation' will be more than ever sought after. London Matriculation and other examinations which the Consultative Committee's 1911 *Report* classified as 'non-educational ex-

aminations' will exert an even greater influence on school work than at present.¹ We can accept most of the Committee's proposals about school records, but there is no reason whatever why they should not be combined with external examinations.

The failure of the *Report* to suggest any solution of the curriculum problems of existing secondary schools is unimportant compared with the depressing picture it paints of the future of education up to 16. Having stated on p. viii that it can have nothing to do with the 'provisional findings of special sciences, whether biological, psychological or sociological', as dictating the aims of education, it proceeds on p. 2, under the heading, 'Variety of Capacity', to make sweeping statements, without evidence, on a matter covered by those very sciences; namely, that children can be classified for educational purposes in three categories, and this is the justification for the present policy of different kinds of education for different children. Three types of school are described, and there are to be three ages of discrimination between children—at 11 to 13, at 16, and at 18. We have already considered the 18+ age, which concerns only grammar schools and at which external examinations are to be retained. We now have to give some attention to the implications of 'secondary education for all' at the other two critical ages—ages at which examinations now play an important part.

The Special Place Examination is to be replaced by some other system (not described) of selecting, at 11, 12, or 13 years, those who are to receive a technical education. We have not discussed in this book the Special Place Examinations which appear in some counties at least to have fulfilled their function better than the Norwood Committee is prepared to admit. There is probably truth in the assertion that 10 to 12 is too young for children to have to work for a vital examination, but I think we ought rather to envisage the ending of a system which requires a final decision about a child's future to be made at this early age, than hasten to interfere with an examination that is working fairly well, and is helping to keep

¹ See Chapters iv and v.

up the standard of English and Arithmetic in the primary schools. The justification for the Special Place Examination is the fact that there are still only a limited number of places in the secondary and technical schools, and that these lead to the best jobs.

Apart from its apparent denial of the principle of equality of opportunity, another serious general criticism of the Norwood Committee's proposals about grammar and technical schools is that they would make a permanent separation between academic work and practical activity. They advocate the removal of those who are naturally more interested in theory into entirely different schools from those who are naturally more interested in practice. I consider that one of the most important tasks of education should be to help the first group to avoid becoming mere bookworms or armchair theorists, and to enable the second group to understand the power of properly organised ideas to help their practical pursuits. In all branches of human activity, success has followed acceptance of the principle that the only true ideas and theories are those that are generalisations from facts or experience. The Norwood Committee seems to envisage an even more academic system of education for the favoured few who are selected for the grammar schools than at present, for it would like to see a greater number of the pupils in these schools 'who show promise of linguistic and literary ability taking Latin as their first rather than their second foreign language' (p. 121). It does not appear to have considered the danger of permanent cultural isolation from the rest of the community of those who pass through these schools to the most responsible and best paid work.

At the age of 16 the Norwood Committee wants to abolish external examinations in grammar schools, and, with regard to technical schools, it writes: 'at present the Junior Technical Schools are free from external examination, and the Technical School of the future should in our opinion be equally free'. I have little direct experience of technical schools, but I find that in 1926 the *Hadow Report* mentioned the following external

examinations as being taken at the age of 15+.¹ The Royal Society of Arts, the London Chamber of Commerce, the College of Preceptors, the Union of Lancashire and Cheshire Institutes, and the East Midlands Union. From conversations I have had, I have formed the impression that the situation in technical schools is not unlike that which led to the introduction of the School Certificate in secondary schools. The *Hadow Report* asked for regional examining bodies very much on the lines we have advocated in Chapter VII. But the Spens Committee 'strongly recommend the establishment of a new type of leaving certificate for pupils in Technical High Schools',² and proposes that this shall be based on internal examinations on the lines of the National Certificate examinations. The latter appear to me to be rather certificates of completion of an approved course than examination certificates in the ordinary sense of the word. The standards of attainment required are certainly very variable as judged by the standards of external examinations.

What alternative do we propose to this Norwood Committee system of internal examinations which will do nothing to link schools with one another or to provide equal opportunities for the pupils in different schools? The Norwood Committee found themselves faced with the problem of defining the relationship between those leaving technical secondary schools and those

¹ *Report of the Consultative Committee on the Education of the Adolescent*, 1926, p. 153.

² The Spens Committee's appreciation of the part played by external examinations in the history of Technical Education is shown in the following extract from their *Report*: '...The State took no action in the direction of aiding technical education until the Great Exhibition of 1851, which drew public attention to the lack of facilities for technical education in England as compared with those provided in various continental countries...[The Department of Science and Art] instituted in 1859 a general system of examinations in science (i) for teachers who receive certificates of competency, and (ii) for students. The examinations were in branches of science related to industrial occupations and formed part of the provision for fostering the study of science among the industrial population' [at p. 51].

leaving grammar schools. Their solution was to abolish an examination which would enable strict comparisons to be made. They state the possible alternatives as follows:

If the present School Certificate examination is retained without alteration or prospect of alteration, it will mark off the secondary Grammar School from other forms of secondary education. A system will then be established under which parity in secondary education will become impossible. For the objective of the School Certificate has become so associated in the public mind with secondary education that the establishment of the Technical School and the Modern School as forms of secondary education will be prejudiced from the outset. The alternative would be that all forms of secondary education should normally look towards the School Certificate examination—a hypothesis which is so out of relation to the needs of the Technical School, where an internal examination, we understand, is working well, and so inimical to the character and future development of the Modern School as to be unthinkable [at p. 46].

If the slogans 'secondary education for all' and 'equality of opportunity' are to mean anything, we surely have to consider the alternative that the Norwood Committee have rejected, namely, 'that all forms of secondary education should normally look towards the School Certificate examination'. The nation's not-too-ambitious objective should be to provide the best possible general education for *all* children up to the age of 15 or 16, preferably in the same schools. Multilateral schools would reduce the importance of the 11-13 selections, and so justify the abolition of the Special Place Examinations. They would also make possible the same sort of differentiation of curriculum as exists to-day in every secondary school which is large enough to provide for several 'streams'. Even the present School Certificate is flexible enough to cater for all these streams. Could it deal with the added numbers that would follow 'secondary education for all'?

The School Certificate Examination is at present taken by one-tenth of the children in the country. Would it be necessary to adapt the system to accommodate the remaining nine-tenths, if equal opportunities were to be available for all? Probably not, because only a proportion of the children would wish to

compete, and the remainder would either be satisfied to be placed in forms that did not work for the examination or would not enter. Let us suppose that one-half of those reaching the fifth forms of the multilateral secondary schools entered for the School Certificate Examination. This would amount to about 350,000 a year, and would require twenty-three regional examining bodies, each responsible for about 15,000 candidates, and each covering a population of nearly 700,000. This is only three times the present number of examining bodies. The size of the regions would correspond roughly with the City of Manchester, or the geographical County of Devon, or the three geographical counties of Cambridge, Norfolk, and the Isle of Ely together. There is nothing unworkable about these regions, and the main problem would be of co-ordination between them—a vastly simpler proposition than the co-ordination of some 12,000 different internal examinations, which the Norwood Committee contemplates with equanimity.

The smaller regions would automatically make it possible for all types of school in a medium-sized town to be linked closely so that they became parts of a single educational unit, and transfer from one school to another would be a matter of school organisation. The School Certificate Examination needs to be developed on the technical side to give boys and girls, whose education up to the age of 16 has had a technical bias, a fair opportunity of competing with the rest for a place on the main road to the universities. We need to develop the plans set out in Chapter ix of the Hadow Report, and, at the same time, to modify the School Certificate Examination so that regional examining bodies would have the task of bringing all the new secondary schools into relationship with one another. All children would then have an actual means of competing for the right to go to the university instead of being at the mercy of personal recommendation.

The standard of education and ability of those reaching the universities and professions would rise beyond all belief if genuine competition among all children for a place in the Sixth Forms were possible. The distinction between 'technical' and

'academic' education could be gradually reduced until it no longer existed at all for students as young as 15. As we began to draw upon the vast reserves of natural ability which at present remain untapped, the phrase 'equality of opportunity' would take on a new meaning. The opportunity to compete for the education or employment they desire would have a tonic effect in increasing the skill and ability of all children, and indirectly of their teachers. But this requires a liberally conceived examination system, controlled by people who will guard children against the effects of *excessive* competition, linked with the provision of new universities.

Child-centred Education. The Norwood Committee attaches importance to the educational philosophy underlying its proposals. This philosophy, which is expounded in the Introduction to the Report, has already been criticised by *The Times* (in a leading article on the day of publication), Sir Fred Clarke,¹ Dr Julian Huxley,² and others. It differs radically from that on which this book is based.

We may say that the positive aspect of the Norwood Committee's philosophy as it concerns us in this book is their advocacy of 'child-centred' education. Its negative aspect is its refusal to accept a theory which seeks 'to fit pupils to determine their outlook and conduct according to the changing needs and changing standards of the day', or which concerns itself 'with relative ends and the immediate adaptation of the individual to existing surroundings'. There are many teachers to whom the ideal of child-centredness appeals as something which allows full scope to the child's individual capacities. They feel that competition has too great a part in our education. As examinations are based on competition, and as one of the major proposals in this book concerns the provision of machinery for adapting the curriculum to 'the changing needs of the day', it is necessary to devote a little attention to these points.

The word 'competition' is used loosely to cover many different relationships. We have unconscious competition between plants

¹ *The Spectator*, August 20, 1943.

² *The Times Educational Supplement*, August 28, 1943.

and lower animals, many forms of conscious or active competition between human beings, and, at the highest stage, such controlled and planned competitions as games. Competition and co-operation are often contrasted, but they have more in common than is generally realised, and it is a small step from rivalry between children to co-operation. Competition places the competitors in a common situation and so provides the common experience necessary for co-operation. The real opposite both to competition and to co-operation is isolation, i.e. lack of any relationship. (See also p. 52.)

Competition of one kind or another is thus seen to be part of the environment in which humanity has developed, and all social activity includes elements of competition. One problem of the teacher is to control and guide competition into valuable channels. If left to itself, it may take various unsatisfactory forms, such as rivalry for the favour of the teacher or exhibitionism. Similarly, the rivalry between teachers may be diverted into the unsatisfactory channels of competition for the favour of inspectors instead of the satisfactory channels of co-operation that we have advocated. Favouritism and examinations have often been contrasted.

But we have to recognise another element in children, namely, their individual histories, habits, interests, aptitudes, and ambitions. Under certain forms of acute competition these individual capabilities do not have sufficient scope. The nineteenth century remains a lesson to many of the evils of unbridled competition. But, although it may be convenient sometimes to think of the individual in terms of its own life history and character, and sometimes in terms of its relationship with others and with the world, these two aspects cannot be separated. Individual habits, impulses, and ambitions are formed or modified in the course of social life; and, without them, there could be neither competition nor co-operation. When teachers encourage children to embark on joint tasks, as in the various project methods, they give scope for both co-operation and rivalry. Games, sports contests, inter-house competitions, exhibitions, shows, examinations, and even whist

drives, are all forms of controlled competition. The task of teacher, school, and examining body is to develop those kinds of competition which release energy and call forth a characteristic response from each individual, and to do away with or modify those kinds which overstrain the young student or keep too tight a hold on him.

A controlled competition is an organised form of rivalry in which rules are drawn up to define, among other things, the meaning of the term 'best'. I have tried to show in the earlier chapters of this book what a powerful influence an examination can exert on those who come within its range, and I have stressed the extreme importance of placing responsible and representative bodies in control of all examinations. It is worth noticing that these same considerations apply to other competitions than examinations. The headmaster of a secondary school tells me that his school entered a team regularly for a local singing contest, and that it was generally the winner; but that he found it necessary to withdraw from the contest because the influence on the school singing was bad, in that the boys acquired the habit of muffling their voices instead of singing naturally. Either this was an example of a bad competition because the judges failed to give marks to the right qualities, or the competition was so limited that the school team was never opposed to one which was able to win by singing more naturally. Had my headmaster friend been in a position to influence the definition of the term 'best' in this competition, he would have had a part in arranging for it to stimulate all the teams to the right kind of performance. Similar questions arise in athletic contests and in horticultural and agricultural shows. The relative stress laid on field events, long distance races, or sprinting will influence the physical development of the boys competing. Quite elaborate rules and organisations are required in such competitions as milking trials and egg-laying trials, and we find the rules being drawn up with an eye to their social effect, and not merely to the need to make the trials fair for all. Some forms of competition encourage initiative and enterprise, others suppress these qualities. It is

interesting to note that even in Russia where the common hatred of the invader has provided a tremendous incentive to activity, it has been found necessary to make use of many kinds of controlled competition to help the people to direct their energies in the most valuable channels. The Russians have managed to make their definition of 'best' involve co-operation, so that the highest-paid workers are those who co-operate most successfully with their workmates.

While the main outlines of curriculum can be defined by syllabuses and textbooks, its interpretation depends upon the activities of the pupils and their teachers. An examination or other organised competition based on an agreed curriculum is a means of translating the hopes and plans of the drafters into actual performance while giving full scope to individuality. If curriculum committees are the instruments for keeping the plans for education in touch with the changing needs of the times, properly devised examinations supply conditions which call forth the enterprise and energy of the students in a useful and educative way for the fulfilment of these plans.

In its extreme form child-centred education would be the education of an isolated child. The Norwood Committee appears to favour the compromise of creating an isolated environment 'which will enable the children to grow aright and to grow eventually to full stature' (stated twice on p. 55 and on p. 59). They do not define 'aright' or 'full stature', and do not seem to recognise that these are relative terms. The education of children is not comparable with the simpler problem of their physical development or the cultivation of plants and the rearing of animals. In these fields, if the living thing is properly nourished and placed in a suitable environment, it will grow to the healthy adult stage. But the full stature (mental and spiritual) of a human being depends upon the society in which he lives, and in its turn influences that society. It is impossible to come to an understanding of the meaning of progress and social development unless one discards such static concepts as 'full stature', and such arbitrary ones as 'grow aright' in relation to human beings. A fully developed

adult in England to-day is different from his counterpart in the Middle Ages, or even a hundred years ago, and it is to be hoped that the inhabitants of England a hundred years hence will be different from us. Mr J. B. Priestley writes: 'Contemporary man is essentially a co-operator, and it is precisely his capacity for team work and communal effort that distinguishes him from older historical types. Individually we are not as brilliant as the Elizabethans, but in co-operation we can do things that would make their hair stand on end.'¹

Great Britain will not maintain her position in the modern world unless she repudiates the educational philosophy set out in the *Norwood Report* in favour of one which recognises the close inter-connection between the development of the higher faculties of the individual and the world of men and things in which he lives.

¹ *Reynolds' News*, Sunday, September 26, 1943.

APPENDIX I

Notes on the Use of Aggregate Marks in the Cambridge School Certificate and Higher School Certificate Examinations

It has not been possible to discuss the technique of examinations in this book, but I think it advisable to add a few notes on some of the methods adopted in the Cambridge examinations, partly because there is still so much ignorance in schools about examinations, and partly because of a prevalent tendency to underrate the importance of a candidate's aggregate mark for the whole examination. In these notes I have found it necessary for the sake of brevity sometimes to make statements without attempting to justify them.

1. Much has been written on the subject of the assignment of marks to the results of examinations and tests. We are only concerned here with the fact that a competition arranges the competitors in an order of merit. It is purely a matter of convenience what marks are assigned to those occupying the various positions in that order of merit. The range of (standardised) marks adopted in the subjects or papers of school examinations in England has never been settled by agreement, but conforms by custom to something between the following extremes:

	Scales of marks on a basis of 100 possible	
	Highest scale	Lowest scale
The best candidates get about	90 marks	80 marks
5 per cent of the candidates get about	75 "	66 "
50 per cent of the " "	50 "	40 "
75 per cent of the " "	40 "	30 "
The lowest " "	20 "	10 "

Different examining authorities use different scales. Some do not think of their scales in terms of percentages of candidates. They take a normal pass mark of (say) 40, and a normal distinction mark of (say) 70, and adapt their marks accordingly. I wish to stress two points only. First, that, by taking 70 as distinction mark rather than as the mark reached by a certain proportion of candidates, an examining authority is utilising the ability of its examiners to indicate the standard of work which they have found over a number of years is produced by a percentage of students even though in any one year

there may be less, and in others more, than this percentage. In some subjects which are marked mainly or partly by impression, the experienced examiner carries within his head a most efficient estimator of statistics. Secondly, that no amount of reasoning, mathematical or otherwise, will prove that one scale of marks is intrinsically correct for all examinations, or even for a single examination. The choice of a scale is a matter of convenience and policy only. It may be convenient that it should differ for different examinations.¹

2. One of the least explored problems of examinations is how to combine the results of different tests. This is a subject that deserves a thorough investigation from a historical standpoint, and also in the light of the methods used in different examinations to-day.

We can recognise two almost opposite methods, each of which is employed to some extent in every examination. The first is to require the candidates to reach a certain 'standard' in *each* separate test, and to place those who fail in one test below those who succeed in all. The second is to add the marks for the various tests so that the candidates are placed in a final order of merit by the aggregate of their marks. For example, in the School Certificate Examination as originally conceived, the candidate entered for five, six, seven, or eight subjects, and, in order to gain a certificate, had to reach the pass standard in each of five subjects chosen according to certain rules. A candidate who just passed in the essential subjects was successful, whereas a candidate with twice as many marks, but a narrow failure in one essential subject, was unsuccessful. In some Civil Service Examinations, on the other hand, separate passes are not expected.

The two systems are each useful in their own way. The 'separate passes', or 'hurdle', system prevents a student from neglecting an important subject or part of a subject, but it is inflexible, and often leads to hardship or injustice. The aggregate system has the merit of extreme flexibility, but it fails to direct attention to any specific part of the curriculum. It has the same advantages and disadvantages as 'points' rationing.

3. The aggregate system plays a large part even in the School Certificate Examination as originally conceived by the Board of Education. Thus, the marks for the *separate questions in a paper* are added to get a total for that paper, and the marks for the separate papers in subjects like Mathematics, English, etc. are added together in order to discover whether a candidate passes in the whole subject. It is well known also that a system of 'compensation' has been

¹ Cf. British Association, *Report on University Entrance Scholarships*, July 1942: iv. 9.

introduced to mitigate the hardships of the 'separate passes' requirement, so that a candidate may be allowed to be a certain number of marks below the pass in one subject, if he has a sufficient number of marks to spare in others.

4. As the Cambridge examinations have recently been converted from a 'separate pass' to a predominantly 'aggregate' basis,¹ I shall mention some of the advantages and some of the difficulties attached to the latter system. The popularity of separate passes has been due as much to the simplicity of administering them as to any inherent educational merits they may have. Since no aggregates are made under this system, it does not matter on what scale the marks in the various subjects are assigned. They have fulfilled their purpose when they have enabled the examiners to classify the candidates in each subject separately as 'pass' or 'fail'. An aggregate examination with a choice of subjects would be grossly unfair unless the marks in the different subjects were standardised.¹

5. We have to distinguish two different cases in obtaining an aggregate from the marks for different papers, namely, (a) when every candidate takes the same papers, and (b) when there is a choice of papers so that one candidate's aggregate may include marks for Latin but not Physics, whereas another's may include Physics but not Latin. It is clearly vital that, when Latin and Physics are alternatives, the range of marks in the two subjects shall be strictly comparable. But, when all the candidates take both subjects, it would not be unfair to mark Latin out of 50 and Physics out of 100, provided the candidates knew that Latin was a less important subject to them than Physics.

6. When every subject is compulsory and is supposed to carry the same weight, the problem of making the examination fair is concerned only with interpretation of the phrase 'carry the same weight'. Many people think that two subjects necessarily carry the same weight if they are marked out of the same total. This is a fallacy. The 'spread' of the marks awarded, and not possible full marks, is the important factor in determining the weight carried by a paper or subject. (This spread can be measured by the standard deviation of the marks from the mean, but in examinations it is sufficient and more convenient to use the intervals between given percentile marks—for example, the inter-quartile range.)

¹ It is an interesting fact that the Civil Service Commissioners have a longer tradition of mark standardising than the approved Examining Bodies who first turned their attention to this subject in the award of scholarships on the Higher School Certificate Examinations to candidates taking different groups of subjects.

7. When all the subjects are taken by all the candidates, the order of merit, measured by the aggregate of the marks for the subjects, is unaffected by adding (say) 10, or even 100, to all the Latin marks; but, if these marks were increased by 10 per cent, Latin would carry 10 per cent more weight in the examination, and the order of merit would be altered. For example, a candidate with 70 marks for Latin would receive 7 extra marks, whereas a candidate with 30 would receive only 3 extra, and the relative positions of these candidates would be altered.

On the other hand, when there is a choice of subjects, a flat addition of 10 to all the marks in one subject obviously gives those taking it an advantage over those not taking it. In such cases, therefore, we have to take into account not only the spread of the marks but also the average mark.

8. To secure 'fairness' when there is a choice of subjects, it is not satisfactory to adjust the marks to make the average mark the same in all subjects unless there is some reason to assume that the candidates taking one subject are on the average 'as good as' those taking another.¹ We can see that there are sometimes cases when the examining body would not be justified in making this assumption. Suppose, for example, in an examination taken by 100 candidates, the 30 weakest (judged by the rest of their work) were to choose Latin, and the 30 strongest were to choose Physics. There could be no justification for assigning to the first batch marks as high in Latin as those assigned to the second batch in Physics. On the other hand, we can imagine a case in which the 30 Latin candidates were of average ability, but known to be weak at Latin compared with candidates taking other examinations, because of the limited time available for the subject in the school curriculum. In this case the examining body might decide to raise their Latin marks to the same average as the Physics marks, with the object of giving encouragement to Latin. It is worth noting though that this procedure, if carried too far, might have the effect after a year or two of producing the very situation just mentioned in which the weakest candidates chose Latin.

I should be exceeding the task I have set myself if I attempted to discuss all the considerations involved in the standardisation of marks in subjects taken by different sets of candidates, or the technical methods available. I will content myself with saying that I think an examining body is justified in adopting the policy of equating both the average mark and the spread of the marks in subjects taken by

¹ I make no attempt to define the term 'as good as', because, in the last resort, it is a matter of policy to decide whether this assumption is to be made in any given case.

large numbers of candidates drawn from a number of different schools, when the school time allowed is the same for both, and sometimes when it is different.

9. When there is provision for candidates to offer different numbers of subjects further problems arise. Thus, the records show that when the Cambridge examinations were first introduced, and until a few years ago, a total of all a candidate's marks was made however many subjects he offered, except that the marks for subjects in which the candidate failed were excluded. The aggregates thus obtained were used only in awarding Honours to the best candidates. The exclusion of marks below pass was intended, of course, to discourage candidates from offering extra subjects which they had not studied seriously, and to prevent those who did so from securing any advantage.

10. The present Cambridge method for the SCHOOL CERTIFICATE Examination is an adaptation of the former, and is intended to produce an aggregate that can be used for all purposes as a measure of the candidate's attainment. It can be summarised as follows:

(i) 'Pass', 'Credit', and 'Very Good' standards are fixed in each subject at meetings of the Awarding Committee with representative subject examiners.

(ii) The marks for each subject are adjusted, mainly by percentage additions or deductions, so that the intervals between the marks fixed for Pass, Credit, and Very Good are the same for all subjects. (This may be taken to be a method of obtaining the same spread of marks. To reduce the amount of clerical work, some subjects, like Mathematics, which are always widely spread, are originally marked out of less than the normal total, and others, like English, which are always 'bunched', are marked out of more than the normal total.)

(iii) By uniform additions or deductions, the minimum marks for Pass, Credit, and Very Good are made the same in all subjects (70, 90, and 125 out of 200).

(iv) A further uniform deduction of 40 marks (out of 200) is now made from the marks in all subjects, so that the three standards become 30, 50, and 85, and marks below 41 are shown as zero.

(v) These scaled marks are entered on the final mark sheets, and the candidate is credited with their aggregate, however many subjects he takes.

11. It should be noted that the weight attached to the marks in a subject is determined when the standards are fixed. It is thus appropriate that this important task should be in the hands of the Committee responsible for the interpretation of the results. The deduction of 40 marks out of 200 is intended to secure a proper relationship between the aggregates of candidates taking different

numbers of subjects, with a view to encouraging those schools or candidates who wish to spread their work over a wide field, without giving an advantage to those who send up very weak work in a subject. If the deduction were different from 40, the order of merit of candidates taking unequal numbers of subjects would be different.

12. The candidates are then classified by their aggregate marks, provided (i) they pass in English Language, (ii) they pass in four other subjects, (iii) they reach at least 50 marks out of 200—10 on the final mark sheets—in a fifth subject, and provided these five subjects include a foreign language or mathematics or a science in accordance with the Secondary School Examinations Council's regulations. Each candidate's results are then reviewed by two members of the Awarding Committee, who return the scripts in any vital subject to the chief examiners for the marking to be checked.¹ A vital subject for this purpose may be English Language or one of the minimum number in which a pass is required, or it may be a subject in which 'Credit' is required for exemption from some university or professional examination. Finally, the Committee makes a decision on borderline results after considering any special circumstances that may have been brought to its notice by examiners or teachers.

13. This system has the advantage over the old system that, although requiring passes in four² of the five subjects which a candidate must take, it offers a reward for specially good work in any one of these subjects and also for any work in a sixth or seventh subject, provided it is not very weak. In practice, the aggregate becomes the main classifying agent—or, as the scientist would say, 'the operative factor' in deciding whether the candidate passes. It stimulates work in all subjects without having a rigid requirement in any (except English Language), and yet it is able to direct special attention to certain groups of subjects.

14. The aggregate system has the further advantage that it could be used in the future to define a higher standard than the present pass in the whole examination. This standard could be used as a common entrance requirement for all universities without having the inflexible character of the present London Matriculation. The flexibility of the system facilitates adaptation of the examination to different types of school or student.

¹ In English Language, marks are obliterated from the scripts and the chief examiners are required to re-mark the work independently. The candidates are credited with a weighted mean of the two independent marks.

² The subject in which a candidate does not 'pass' is not mentioned on the certificate.

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15. We must not overlook the fact that an examination which includes a choice of subjects can only be conducted on an aggregate basis if the distribution of the marks is scientifically controlled; that is, if statistics are intelligently used to express the policy of those in control of the examinations.

16. The use of aggregate in the Cambridge HIGHER SCHOOL CERTIFICATE Examination involves additional problems, because this examination includes some papers which are taken by only small numbers of candidates; and because the peculiar 'unit' system of this examination allows candidates to offer single papers in a subject.

The marks for each paper are separately standardised. The scale of marks at present adopted in a paper (not the whole subject) on a basis of 100 marks is:

85 and over (Special Mention level)—about 2 per cent of the best candidates.

75 and over (Distinction level)—about 7 per cent of the candidates.

62 and over (Good Standard)—about 30 per cent of the candidates.

45 and over (Pass)—about 75 per cent of the candidates.

In some papers, the numbers are sufficiently large, and the candidates are drawn from a sufficient number of schools, to provide a fairly stable basis for the use of statistics. In the majority, however, it is necessary to rely on the co-operation of the examiners in fixing standards, and some or all of the following aids are utilised:

(1) The ability of examiners in subjects that are marked partly by impression to relate the work approximately to that of other candidates in previous years or in other examinations.

(2) The performance of the same candidates in other related papers.

(3) The marks of any candidates who have taken the corresponding paper before.

(4) The school estimates.

17. Another consideration that has to be kept in mind in standardising the marks in this examination is the need to secure comparable results in different *subjects* as opposed to different *papers*. For example, the candidates who gain high marks in one of the two theory papers of Biology do not necessarily do very well in the other paper of the subject, since the papers cover different subject matter; whereas, in Mathematics, a candidate who does well in one paper generally does well in another. This makes it necessary to allow a wider spread of marks in the separate Biology papers than in the separate Mathematics papers in order that a candidate may have the same chance of receiving a given mark in Biology and in Mathematics when the marks for the papers have been added together to obtain the marks for the whole subject.

APPENDIX II

Cambridge Senior Local Examination in 1861

GENERAL REGULATIONS

There will be two Examinations, commencing on Monday, December 16, 1861, at 2 P.M.; one for Junior and one for Senior Students.

Students will be examined in such places as the Syndics, appointed by the University, may determine.

After each Examination the names of the Students who pass with credit will be placed alphabetically in three honour classes, and the names of those who pass to the satisfaction of the Examiners, yet not so as to deserve honours, will be placed alphabetically in a separate class. Separate Lists will also be given of those Candidates who may specially distinguish themselves in particular parts of the Examination, and in these lists the Candidates will be arranged in order of merit. After the name of every Student will be added his place of residence, the school (if any) from which he comes to attend the Examination, and the name of his Schoolmaster.

In determining the classes account will be taken of every part of the Examination; but no credit will be given for knowledge in any section, unless the Student shows enough to satisfy the Examiners in that section. Regard will be paid to the handwriting and spelling throughout the Examinations.

The Students who pass with credit, or satisfy the Examiners, will also be entitled to receive Certificates to that effect. Every Certificate will specify the subjects in which the Student has passed with credit, or satisfied the Examiners, and the class in which his name is placed.

Every one, admitted to Examination, will be required to pay a fee of twenty shillings.

EXAMINATION OF SENIOR STUDENTS

Students must be under 18 years of age on the day when the Examination begins.

PART I. PRELIMINARY.

Every Student will be required to satisfy the Examiners in

1. Reading aloud a passage from some standard English poet.
2. The rudiments of English Grammar, including the analysis of sentences.

APPENDIX II

3. Writing a short English composition.
4. The principles and practice of Arithmetic.
5. Geography:

Every Student will be required to answer questions on the subject and to fill up an outline map of some country in Europe, showing the boundary lines, the chief ranges of mountains, the chief rivers, and the chief towns.

6. The outlines of English History; that is, the succession of Sovereigns, the chief events, and some account of the leading men in each reign.

PART II.

The examination will comprise the subjects mentioned in the following nine sections; and every Student will be required to satisfy the Examiners in three at least of the sections marked A, B, C, D, E, F, G; or in two of them, and in one of the sections marked H, I: but no one will be examined in more than five of the sections marked A, B, C, D, E, F, G. Section A must be taken by every Student, unless his parents or guardian object to his examination in that section.

SECTION A.

Religious knowledge:

The Examination will consist of questions in

1. The Historical Scriptures of the Old Testament from the death of Moses to the captivity of Judah.
The Gospel of St Mark and the Acts of the Apostles: credit will be given for a knowledge of the original Greek.
2. The Morning and Evening Services in the Book of Common Prayer; and the Apostles' Creed.
3. Paley's *Horæ Paulinæ*.

Every Student, who is examined in this section, will be required to satisfy the Examiners in the subject marked 1, and in one at least of the subjects marked 2 and 3.

SECTION B.

1. English History, from the Restoration to the Peace of Paris (1783); and the outlines of English Literature during the same period.
2. Shakespeare's *Henry VIII.* with historical and philological questions.
3. The outlines of Political Economy.
4. Physical, Political, and Commercial Geography.

A fair knowledge of one of these four divisions will enable a Student to pass in this section.

SECTION C.

1. Latin:

Passages will be given from Cicero, *Philippics*, II. and Virgil, *Georgics*, IV. for translation into English, with questions on the historical and geographical allusions, and on Grammar:

Also passages for translation from some other Latin authors:

And a passage of English for translation into Latin.

2. Greek:

Passages will be given from Xenophon's *Memorabilia*, Book I. and Euripides' *Phænissæ*, for translation into English. Questions will also be set on the language and subject matter.

Also passages for translation from some other Greek authors.

A fair knowledge of either of these languages will enable a Student to pass in this section.

SECTION D.

1. French:

Passages will be given from Racine's *Les Plaideurs*, and Mignet's *History of the French Revolution* to the death of Robespierre, for translation into English, with questions on the historical allusions and on Grammar:

Also passages from some other French authors for translation into English:

And a passage of English for translation into French.

2. German:

Passages will be given from Schiller's *History of the Thirty Years' War*, Book III. and Goethe's *Iphigenia*, for translation into English, with questions on the historical and geographical allusions, and on Grammar:

Also passages from some other German authors for translation into English:

And a passage of English for translation into German.

A fair knowledge of either of these languages will enable a Student to pass in this section.

SECTION E.

Every student, who is examined in this section, will be required to satisfy the Examiners in

Euclid, Books I. II. III. IV. VI. and XI. to Prop. 21 inclusive.

Arithmetic and Algebra.

Questions will also be set in the following subjects:

1. Pure Mathematics:

Plane Trigonometry, including Land-surveying.

The simpler properties of the Conic Sections.

and Wharrie, 42, Berry Street, Liverpool, are willing to supply complete sets of the apparatus allowed at a cost of 12s. the set.

5. The Local Committee are strongly recommended to supply the Candidates with apparatus, but if they do not choose to do this their Secretary is requested to send without delay to each Candidate in Chemistry a copy of the list, and at the same time inform him that he will have to procure his own apparatus.

SPECIMENS OF THE QUESTION PAPERS

WEDNESDAY, Dec. 18, 1861. 2 to 3½ P.M.

I. 3. English Composition

(PRELIMINARY.)

[N.B. All Candidates are required to satisfy the Examiners in this Paper.

Particular attention should be paid to spelling, punctuation, and grammatical correctness.]

Write on any *one* of the following subjects:—

A sketch of the life of Alexander the Great, *or* Peter the Great, *or* Warren Hastings.

Christmas Time in England.

The Plot of one of Shakespeare's Plays.

A summary of the national events that have occurred within your memory.

The events now taking place in the United States.

TUESDAY, Dec. 17, 1861. 2½ to 3½ P.M.

I. 6. Outlines of English History

[N.B. Every Candidate must satisfy the Examiners in this Paper. Four questions at least should be attempted.]

1. Name in their order the Plantagenet Kings, with one or two principal events in each reign. Describe the parentage, character, and death of Richard II., and the claims of his successor to the throne.

2. In whose reign did the Wars of the Roses begin? At what places and with what results were the first and last battles fought? By what arrangement were the two Houses united?

3. Write against each of the following names the reigns in which they lived, and a few brief particulars in their histories:—Chaucer,

Latimer, Cardinal Pole, Strafford, Lord Bacon, Sir Isaac Newton, Sir Robert Walpole.

4. Between whom, in what reigns, and with what results, were the following battles fought:—Bannockburn, Blenheim, Marston Moor, Poitiers?

5. In whose reigns did the following events take place:—the Discovery of America, the Inventions of Printing and Gunpowder, the Formation of the East India Company, and the Passing of the Toleration Act?

6. Name the sovereigns since the Revolution, with their titles to the Crown, and their chief Ministers of State.

FRIDAY, Dec. 20, 1861. 11 A.M. to 12½ P.M.

II. B. 3. Political Economy

1. How far is it true that Political Economy assumes that the desire of wealth is the only motive of human beings? To what extent does the inaccuracy of this assumption affect the truth of the results obtained?

2. Mention any ways in which the division of labour increases its effectiveness. Give examples. State any reasons which make it probable that division of labour can be carried further (1) in manufacture than in agriculture, (2) in articles of great consumption than in articles of small consumption.

3. Distinguish between productive and unproductive labour, and, in conformity with your distinction, assign each of the following to one class,—labourers on a railway, agricultural labourers, workmen employed in constructing workshops or an exhibition building, teachers of music, public singers, painters, tax-collectors, and soldiers.

4. What ambiguity is there in the common use of the word "Value"? Would a dress-coat be of the same value in London, Timbuctoo and Melbourne? What circumstances would affect its value?

5. If the quantity of bullion in every coin in England were doubled to-morrow and there were no paper currency, what would be the chief effects on the wealth of individuals in England, of England generally, and of the world?

6. State shortly Ricardo's theory of rent. If a tax is imposed upon gross agricultural produce, will it be paid ultimately by landlord, farmers, or labourers?

What is meant by the cottier, métayer, and ryot tenures of land?

7. What is Malthus's Law of Population? Why is population likely to increase faster in a colony than in an old country?

8. What circumstances chiefly determine the rate of profit in particular trades and in the country at large?

9. State as clearly as you can the argument in favour of Free-trade in corn, pointing out its probable effects on labourers employed in manufacture and agriculture.

10. If corn and cloth can both be produced with less labour in Poland than in England, can it be worth while for Poland to export corn to England in return for cloth instead of manufacturing cloth herself?

II. F. I. Chemistry

[Two hours allowed for this Paper.]

1. State the composition, and describe the eudiometrical analysis of the air. What reasons are there for supposing that it contains organic matter?

2. From what sources is the ammonia of commerce principally derived? Give a series of compounds in which the hydrogen of ammonia is partially or entirely replaced.

3. Describe the manufacture of sulphuric acid, giving the various reactions in chemical symbols. How may lead, arsenic, and nitric acid be detected in impure sulphuric acid?

4. Give some account of the analogies of oxygen and sulphur.

5. What are allotropic bodies? Give several instances, and discuss in particular the chemical and physical differences of common and amorphous phosphorus.

6. What is meant by the terms atomic weight, atomic volume, atomic heat?

7. What are the principal ores of iron? Describe the process of obtaining the metal from some common ore.

8. Describe and explain the process of obtaining *one* of the following substances:—carbonate of soda from common salt, calomel from mercury, or silver from some one of its ores.

9. A substance on analysis gave $H=1.59$, $N=22.22$, $O=76.19$; find its formula.

10. Describe and explain the preparation of oxalic acid from starch. How may salts of lemon be distinguished from Epsom salts?

11. Describe the process of preparing common ether, and explain the theory of it. Explain the principle of the process by which ether is purified from admixture with alcohol.

II. F. I. Practical Chemistry

[Two hours allowed for this Paper.]

N.B. In answering these questions each experiment made should be stated, and the result and conclusion drawn from it; and finally the conclusion drawn from the whole.]

1. The substances H and L each contain one Acid and one Base which you are required to determine.

2. Of the substances M, N, O, find which contains Arsenic, which Sulphur, which Lead, which Silica.

3. Find the Acid in P.

4. Analyse the substance Q.

[H Alum.

L Phosphate of Soda.

M contained Silica.

N contained Lead.

O contained Sulphur and Arsenic.

P Fluor Spar.

Q Alloy of Silver and Lead.]

WEDNESDAY, Dec. 18, 1861. 10 A.M. to 12 M.

II. G. 2. Botany

1. Define *inflorescence*, *vernation*, *æstivation*. When is the calyx said to be inferior, and when superior?

2. What parts of plants are Onion, Bean, Potato, Radish, Celery, Asparagus?

3. Describe the seed of a dicotyledonous plant; and the changes that take place in it when germinating.

4. Open and describe specimens (1) and (2).

5. Describe fully, but in few words, specimens (3) and (4).

6. Refer to their natural orders—Hop, Pea, Cabbage, Peppermint. What are the essential characters of the order Rosaceæ?

7. At what part of the leaf, and by what organs, are absorption and exhalation carried on? How are these processes influenced by the presence or absence of light? What matters are absorbed and exhaled, respectively?

8. Of what external parts does a perfect pistil consist; when is it simple and when compound? Describe the internal structure of a

simple pistil, pointing out the positions of the placenta and the ovules. When the fruit is a *drupe*, what parts of the ovarium are changed into the kernel, its shell, the flesh of the fruit, and the rind, severally?

9. Which of the cereals are principally cultivated as food for man in the higher, middle, and lower latitudes of Europe? Indicate as nearly as you can the Northern limit of wheat cultivation on that Continent.

- [(1) Pod of Radish.
- (2) Capsule of Thorn-apple.
- (3) Primula, leaf and flowers.
- (4) Coronilla.]

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